

Normative Relations under Heterogeneity: Relational Reconstruction and Interpretive Mediation

Wanhong HUANG
huangwanhong@serendip.ngo

Abstract

Relations among heterogeneous entities create an ethical and epistemic problem that is not exhausted by uncertainty about moral status, consciousness, sentience, autonomy, capabilities, or vulnerability. In sufficiently heterogeneous relations, participants and interpreters may differ not only in their evaluations of a shared situation but also in the conceptual and epistemic structures through which the relation itself becomes intelligible. This paper develops a preliminary Generative Relational account of that problem. It suspends claims that moral status or obligation is ontologically given by membership in a particular class of entities, while allowing normative structures to become relationally real through historically generated relations, interpretations, institutions, and practices. Artificial-artificial, artificial-animal, animal-alien, and alien-alien relations are used as conceptual stress tests rather than as a fixed moral taxonomy.

The paper develops three principal analytical distinctions. First, it separates heterogeneity among participants from heterogeneity in the epistemic positions through which their relations are reconstructed. The difficulty of normative judgment can depend on asymmetric distributions of prior interaction, communicative access, causal understanding, historical records, and interpretive resources rather than on participant type alone. Second, it examines how unequal epistemic access can anchor reconstruction of an entire relation around the better-understood participant. To discipline this problem, relational reconstruction is separated into observational traces, structural relations, functional consequences, and participant-relative meanings. Third, the paper distinguishes uncertainty within an available interpretive space from conceptual insufficiency and from deeper mismatch between interpretive spaces. These conditions call for different epistemic responses: additional evidence, concept generation, or the development of relational interfaces through which previously unavailable distinctions may become expressible.

The argument further proposes that the interpretive manifold within which normative distinctions become possible should not always be treated as fixed. Interpretive spaces, concepts, equivalence structures, and relevant differences can themselves emerge and change through generative relational histories. Consequently, normative coordination across heterogeneous entities may sometimes require the generation of a partially shared interpretive region before substantive normative disagreement can even be adequately formulated. The paper does not infer from ethical intelligibility that any participant thereby acquires an obligation, standing, or authority to transform another relation. Instead, it treats obligation and governance as further relationally and interpretively mediated questions. This framework also extends the idea of re-cognizability: preserving sufficiently rich relational traces can matter because future interpreters may possess not merely additional evidence, but different conceptual and interpretive spaces through which past relations become newly intelligible.

Keywords: heterogeneous relations; relational reconstruction; interpretive mediation; normative emergence; epistemic asymmetry; conceptual insufficiency; interpretive manifolds; re-cognizability; Generative Relational theory

Discussion Paper Note

This paper is a conceptual and exploratory inquiry into normative relations under conditions of substantial heterogeneity. Its primary concern is not to determine in advance which classes of entities possess moral status, nor to construct a universal decision procedure for relations among humans, artificial agents, non-human animals, hypothetical extraterrestrial life, or other possible subjects. The paper instead examines a prior problem: how a relation can become normatively intelligible when the participants, interpreters, and relevant histories may not share the same forms of embodiment, communication, conceptual distinction, practical orientation, or normative vocabulary.

The paper begins from the Generative Relational commitment to ontological suspension. It does not assume that obligation, moral status, personhood, suffering, justice, or ethical subjectivity exist as transparent ontological properties that can be read directly from an entity. It also does not infer that such phenomena are unreal. Norms, obligations, classifications, and relations can become relationally real when they organize expectations, constrain conduct, redistribute resources, alter institutions, structure recognition, and change the future trajectories available to participants. Their relational reality does not settle their final ontological status.

This position applies equally to familiar human cases. The paper does not retain an ontologically privileged human baseline according to which humans carry self-evident obligations while artificial, animal, or alien entities require special extension. Human–human normativity is itself historically and relationally mediated through language, institutions, legal classifications, shared embodiment, cultural histories, interpretive practices, and accumulated forms of recognition. Radical heterogeneity is therefore used as a conceptual stress test because it removes many of the supports that make ordinary ethical judgment appear immediate. The resulting difficulty can reveal mediation that was already present in familiar cases but was obscured by dense shared history.

The principal examples form a deliberately heterogeneous series. Artificial–artificial relations provide a case in which a human interpreter has some technical and historical experience with the broad type of both participants. Artificial–animal relations place two familiar but deeply different modes of organization within the same relation. Earth–animal–alien relations produce a strong asymmetry of familiarity: one participant is embedded in rich human biological, ecological, legal, and affective infrastructures while the other may be almost entirely unknown. Alien–alien relations provide the limiting thought experiment in which human observers may possess little prior knowledge of either participant and may lack the concepts required to describe the relation adequately. These cases are not offered as a moral hierarchy or as empirical claims concerning artificial consciousness or extraterrestrial life. They function as pressure tests for the epistemology of relational judgment.

A central distinction of the paper separates heterogeneity among participants from heterogeneity in epistemic position. The relation between participants can be highly heterogeneous even when an interpreter knows both participants well. Conversely, two participants may resemble one another while an external or newly involved interpreter has very poor access to both. The analytical problem is therefore not exhausted by the identities or substrates of the participants. It also concerns the distribution of prior interaction, communicative access, causal understanding, historical records, observational capacity, and interpretive resources across the relational field.

The paper uses this point to develop the idea of an epistemic geometry of heterogeneous relations. This expression is not intended initially as a fully specified metric geometry. It identifies the structured differences in epistemic position through which a relation is reconstructed. A participant or interpreter can be close to one part of a relational field and distant from another. Knowledge can be dense along one connection and sparse along another. Such asymmetries can matter because the better-understood participant often supplies the concepts, evidential expectations, temporal scales, and background models through which the relation as a whole is interpreted.

The Earth–animal–alien case makes this especially visible. Human observers may possess extensive knowledge of the animal’s physiology, behavior, distress signals, ecological role, and legal protection while possessing almost no knowledge of the alien participant. In such a configuration, the human re-

construction of the entire relation may become anchored to the interpretive resources available for the familiar participant. A cry, withdrawal response, or bodily disruption on the animal side may be legible as distress, while the alien action producing or accompanying it may be legible only through human categories such as attack, restraint, treatment, predation, experimentation, or care. The relation can thereby be reconstructed asymmetrically before the unknown participant's own organization has become intelligible.

The paper treats this as a problem of asymmetric epistemic anchoring in relational reconstruction. The proposed contribution is narrower than the claim that familiarity creates bias, which is already well represented in multiple philosophical and social-scientific traditions. The more specific problem concerns the reconstruction of a relation from unequally developed interpretive infrastructures around its participants. Epistemic richness on one side can determine which features of the whole relation become salient, which causal stories are considered plausible, which temporal window is used, and which participant is taken to define the relevant unit of analysis.

To discipline such reconstruction, the paper distinguishes four analytical levels. Trace reconstruction concerns what has actually been observed or recorded: movements, signals, state changes, resource transfers, interruptions, deletions, alterations, and temporal sequences. Structural reconstruction concerns the relational patterns inferred from those traces, such as asymmetry, dependency, reciprocity, confinement, repeated unilateral control, or persistent coupling. Functional reconstruction concerns what the relation does within the organization of a participant, for example by changing future behavioral possibilities, interrupting communication, altering memory, modifying reproduction, generating dependency, or producing irreversible state changes. Participant-relative reconstruction concerns how the relation is understood within the participant's own interpretive organization, including whether categories such as injury, consent, cooperation, escape, identity, ownership, or death are applicable at all.

These levels should not be read as a universal linear algorithm. In practice, evidence can move repeatedly among them, and urgent action may occur before participant-relative interpretation is complete. Their purpose is analytical: to prevent observations of structural or functional change from being silently converted into fully specified normative classifications. A severe reduction of future options can sometimes be described before there is adequate warrant to call that reduction oppression. Repeated memory alteration can sometimes be described before there is adequate warrant to treat memory continuity as the relevant unit of identity for the participant. The distinction preserves what is known while leaving more interpretation-dependent claims open.

The paper further distinguishes three epistemic regimes that should not be collapsed into a single category of uncertainty. The first is uncertainty within an available interpretive space. The relevant distinctions and questions are already available, but the evidence is incomplete. The second is conceptual insufficiency. The available conceptual repertoire lacks a category needed to formulate or discriminate the relevant phenomenon. The third is a deeper mismatch between interpretive spaces. Participants may organize the relation through different dimensions, boundaries, temporal scales, or units of analysis, so that the problem is not merely that one concept is missing but that there is no established common space in which the same normative object is yet constituted.

These regimes suggest different epistemic responses. Ordinary uncertainty can sometimes be reduced by additional evidence. Conceptual insufficiency may require concept formation, revision, or the recovery of distinctions excluded by an existing classification. Interpretive-space mismatch may require the formation of a new interface through continuing relation, partial translation, joint inquiry, or other forms of coordinated reconstruction. More information alone does not resolve every epistemic difficulty, and the invention of an additional label does not by itself produce a shared interpretive space.

This distinction motivates the paper's use of the term *interpretive manifold*. The term is initially a conceptual and formal scaffold rather than a claim that every interpretive system possesses the mathematical structure of a smooth manifold. It refers to the historically available space of distinctions, coordinates, neighborhoods, equivalences, and possible transformations through which phenomena can become intelligible to an interpreter. The paper should not silently assume a single universal manifold within which all entities merely assign different labels to the same underlying point.

Within the Generative Relational account, interpretive manifolds are themselves historically generated. Relations do not occur inside an entirely fixed conceptual container. Repeated encounters, institutions, technologies, languages, conflicts, practices, archives, and forms of coordination can change the distinctions through which later relations become interpretable. The interpreter and the interpretive manifold should therefore be treated as co-evolving with the relational field rather than as external and invariant observers of it.

This claim requires careful positioning in the literature. Historical hermeneutics, pragmatism, phenomenology, enactivism, recognition theory, epistemic-injustice research, anthropology, science and technology studies, and other traditions already provide sophisticated accounts of historically conditioned interpretation, concept formation, situated meaning, and changing horizons. The paper should not present the general claim that interpretation is historical, relational, or revisable as a new discovery. Its narrower task is to show what additional analytical problems appear when normatively relevant relations must be reconstructed across participants whose interpretive spaces are asymmetrically developed or only partially mutually accessible.

The literature review should therefore include philosophical approaches that locate moral relevance in personhood, rational agency, sentience, interests, suffering, reciprocity, recognition, care, dependency, capabilities, or participation in social structures. The capability approach is particularly important because it shifts attention from resources to substantive opportunities and functionings, thereby approaching questions that the present paper expresses through effective option spaces and functional consequences. At the same time, radical heterogeneity raises a prior interpretive problem: which functionings count as constitutive or valuable for an entity whose form of life is only partially understood? Capability evaluation can itself depend upon an adequate interpretive account of the participant's organization and possible forms of flourishing.

Care ethics and relational approaches provide another close neighboring tradition. They already reject a purely atomistic picture of ethical subjects and emphasize vulnerability, dependence, responsiveness, and the moral importance of concrete relationships. Recognition theory likewise examines the constitution of subjects and normative relations through patterns of recognition. Relational approaches to artificial moral standing challenge the idea that moral consideration must be derived entirely from intrinsic properties. These traditions should be treated as resources and intellectual neighbors rather than as positions that the Generative Relational framework simply replaces.

The paper's distinct problem appears one analytical step earlier. Under radical heterogeneity, categories such as vulnerability, dependency, recognition, capability, care, injury, or domination may themselves require reconstruction before they can function as normative bridges. The issue is not only whether an entity satisfies an established criterion but also how the relevant criterion, unit of analysis, and object of evaluation become available within a relation. In some cases the participants may disagree not merely about whether a shared proposition is true, but about what constitutes the phenomenon to which the proposition would refer.

This possibility motivates a distinction between propositional disagreement and pre-propositional relational divergence. Conventional disagreement can be represented as competing evaluations of an already shared object. Radical heterogeneity can precede that stage. One participant may individuate an entity where another interprets a collective process; one may organize an event as a single action while another treats it as a phase of a longer lifecycle; one may identify damage where another identifies transformation or continuation. A shared normative question may therefore have to be generated before the participants can meaningfully disagree over its answer.

The constructive hypothesis is that interaction can sometimes generate a partial relational interpretive region without requiring complete convergence of worldviews. Such a region can support limited translation, practical coordination, mutual prediction, contestation, or the stabilization of local normative expectations. The paper should not claim that every heterogeneous relation will generate such a region, nor that the resulting norms will be just. It should instead examine the conditions under which a partially shared space of normative intelligibility can emerge from continued interaction.

This point connects interpretive emergence to normative emergence. A norm can become relationally

real through repeated coordination, institutionalization, expectation, sanction, mutual adaptation, or historically stabilized practice. Yet the paper must maintain a strict distinction between norm emergence and norm justification. A norm's historical effectiveness does not establish its justice. Domination, exclusion, hierarchy, and exploitative arrangements can also become stable and relationally real. The Generative Relational framework therefore cannot solve the problem of justification by equating emergence with legitimacy.

The paper likewise rejects the inference from ethical intelligibility to practical jurisdiction. Reconstructing a relation as ethically significant does not by itself establish that another participant has standing, obligation, permission, or authority to transform it. This is especially important because earlier formulations of the project used the language of third-party humanitarian responsibility. That language risks placing a human observer outside the relation as a privileged judge, mediator, or intervener. The present paper instead adopts a decentered relational field in which humans, artificial agents, animals, hypothetical aliens, institutions, infrastructures, and ecological conditions occupy different and historically changing positions.

Within such a field, no participant is granted automatic interpretive or normative sovereignty. Some actors may nevertheless acquire distinctive roles through causal participation, dependency, control of infrastructure, shared risk, institutional undertaking, requests for assistance, or other relations. The practical question is therefore not whether an abstract third party has a general duty to mediate heterogeneous relations. It is how normatively relevant positions, reasons, permissions, obligations, prohibitions, and forms of standing become generated and interpreted within particular relational histories.

The possibility of commons or polycentric governance enters at this later stage. It should not be treated as a premise that every heterogeneous relation forms a commons or requires collective governance. Some relations may remain local to their participants. Others can alter ecological, infrastructural, communicative, epistemic, or security conditions upon which additional participants depend. In those cases the scope of relational consequences can change the field within which governance questions arise. Commons-governance and polycentric traditions can therefore provide resources for thinking about coordination without presupposing a single sovereign interpreter, while the present paper asks the prior question of how the relevant shared condition becomes identifiable across heterogeneous interpretive positions.

The temporal dimension of the argument is developed through re-cognizability. Earlier formulations of re-cognizability emphasized the preservation of traces that allow future observers to revisit present classifications. The current paper strengthens this claim by allowing the interpretive manifold itself to change. Future inquiry may not merely possess more evidence concerning the same question. It may generate different dimensions of relevance, different units of analysis, different equivalence structures, and different questions through which the preserved relation becomes newly intelligible.

Re-cognizability under heterogeneous normativity therefore supports the preservation of sufficiently rich relational traces rather than only present-day classified conclusions. Raw or minimally processed signals, temporal sequences, provenance, environmental conditions, competing accounts, resource flows, communication patterns, and distinctions between observation and interpretation can retain value because future interpretive spaces may organize them differently. This does not establish preservation as an absolute moral rule. Preservation can conflict with safety, privacy, autonomy, cost, or urgent protective action. The paper treats re-cognizability as an important temporal consideration whose weight remains relationally situated.

The paper's originality claims should remain deliberately narrow. It should not claim novelty for the propositions that interpretation is historical, that meaning can emerge through interaction, that moral standing can be relational, that concepts can be missing, that horizons can change, that normativity can be embodied or socially generated, or that heterogeneous communities can develop local coordination. Each of those ideas has substantial precedents.

The paper instead develops three primary analytical contributions. First, it formalizes the difference between participant heterogeneity and the asymmetric epistemic geometry through which a relation is reconstructed. Second, it examines how unequal epistemic access to participants can anchor the inter-

pretation of the relation as a whole and proposes a layered reconstruction method that separates traces, structures, functions, and participant-relative meanings. Third, it distinguishes uncertainty within an available interpretive space, conceptual insufficiency, and interpretive-manifold mismatch, connecting them to different epistemic responses: evidence acquisition, concept generation, and interface formation.

A further Generative Relational contribution concerns the temporal extension of these distinctions. Interpretive spaces, normative classifications, and the objects of normative concern can themselves change through history. Practical judgment should therefore remain sensitive not only to present uncertainty but also to the possibility that later relational histories will generate new forms of intelligibility. This provides the bridge from heterogeneous relational reconstruction to the broader Generative Relational programme of historical judgment, archival justice, and re-cognizability.

Several limits should remain explicit throughout the manuscript. The paper does not establish that current artificial systems are conscious, moral patients, or moral agents. It does not make empirical claims about extraterrestrial life. It does not infer obligation from relation, ethical salience from causal interaction, or authority from epistemic access. It does not treat every emergent norm as legitimate. It does not claim that interpretive manifolds are literally smooth mathematical manifolds without further formal specification. It does not provide a completed theory of cross-system norm justification. And it does not assume that preservation, translation, mediation, governance, or intervention is always preferable to non-involvement.

The paper should therefore remain preliminary and diagnostic in tone. Its aim is to identify the epistemic architecture that becomes visible when normative relations cross heterogeneous forms of life or organization, to distinguish problems that require different forms of response, and to develop a modest Generative Relational vocabulary for reconstructing those relations without prematurely importing a universal ontology, a human-centered interpretive privilege, or an automatic obligation to govern what has become visible.

Several commitments guide the discussion:

Ontology is suspended rather than denied; relational reality does not require final metaphysical settlement.

Normativity is interpretively mediated and historically generated, but normative emergence is not equivalent to normative justification.

Human-human ethics is not treated as an ontologically privileged baseline; radical heterogeneity is used to expose mediation already present in familiar relations.

Participant heterogeneity is analytically distinct from heterogeneity in the epistemic positions through which the relation is reconstructed.

Relational reconstruction distinguishes observational traces, structural patterns, functional consequences, and participant-relative meanings.

Uncertainty within a conceptual space, conceptual insufficiency, and interpretive-manifold mismatch are different epistemic conditions and can require different responses.

Interpretive manifolds are treated as historically generable and revisable rather than silently fixed universal containers.

A partially shared interpretive region can sometimes emerge through relation without requiring complete convergence of perspectives or normative systems.

Ethical intelligibility does not by itself create standing, obligation, permission, authority, or a duty to mediate or govern.

No external observer is assumed to possess automatic interpretive sovereignty; practical positions and responsibilities must be reconstructed within the relational field.

Re-cognizability concerns the preservation of conditions for future reinterpretation when later histories may generate not only new evidence and concepts but different interpretive spaces.

The manuscript should distinguish established intellectual precedents from the narrower analytical contributions advanced here and should avoid presenting relationality itself as a novel discovery.

Responsible Use and Rights Reservation

This section separates requested scholarly conduct from the legal permissions stated on the following page. It records an ethical request for responsible use and then defines the narrower scope of retained legal rights.

The author encourages good-faith discussion, criticism, independent inquiry, and responsible use of the material in this work. Separately from the licence's terms, the author asks users to consider foreseeable harms when adapting or applying the proposed framework. This ethical request leaves the licence's permissions and legally authorized uses unchanged.

The author retains the rights preserved under CC BY-NC 4.0 and may pursue remedies to which the author is legally entitled for breach of the licence or violation of the author's independently applicable rights. Reuse remains independent from authorial endorsement. Third-party rights require authorization from their respective holders where applicable. Copyright exceptions and limitations, including applicable forms of fair use or fair dealing, remain fully available.

Notices

This page consolidates the manuscript’s publication status, licence, development disclosure, and research-programme relation.

Status. This working discussion paper records an evolving stage of the author’s position. Its definitions, formal constructions, section structure, literature map, and originality claims remain subject to revision. The present draft is preliminary and should not be read as claiming a completed general theory of heterogeneous ethics or universal norm justification.

Licence. Except where otherwise indicated, copyright 2026 Wanhong Huang. This work is made available under the Creative Commons Attribution-NonCommercial 4.0 International License (CC BY-NC 4.0). Subject to its terms, the licence permits sharing and adaptation for noncommercial purposes with appropriate attribution, a link to the licence, an indication of changes, and attribution that preserves the licensor’s independence from the reuse. Reuse is governed solely by that licence; the responsible-use request on the preceding page remains separate from its terms. The licence deed and legal-code link are available at <https://creativecommons.org/licenses/by-nc/4.0/>. The licence governs in case of conflict with this summary. Third-party material remains subject to the rights held by its respective rights holders.

Statement on the use of language models. The exploratory discussions and preparation of this paper involved OpenAI’s ChatGPT. ChatGPT supported exploratory dialogue, formal reconstruction, source discovery followed by source verification, argumentative criticism, and drafting in $\text{\LaTeX}$. The author selected the research questions, directed and approved the theoretical commitments and epistemic status of the claims, and bears sole responsibility for the manuscript, including its definitions, formal constructions, taxonomy, arguments, conclusions, and errors. Authorship credit remains with the human author.

1 Introduction

This paper examines how normative relations can become intelligible under conditions of substantial heterogeneity. Its point of departure is deliberately simple. Ethical and political judgment usually presupposes that the relevant participants can already be identified, that their actions can be described in commensurable terms, that important forms of injury or benefit are at least partly recognizable, and that the relation itself can be placed within a sufficiently shared conceptual field. These assumptions are often difficult in ordinary human affairs, but they become especially visible when the participants differ radically in embodiment, cognition, communication, organization, temporality, or normative vocabulary. Relations among artificial agents, relations between artificial systems and non-human animals, hypothetical relations between terrestrial animals and unfamiliar extraterrestrial life, and relations among two entirely unfamiliar forms of life therefore provide useful conceptual stress tests. They progressively remove the background similarities that normally allow ethical interpretation to proceed without first examining the conditions that make such interpretation possible.

The resulting problem is broader than the moral status of artificial intelligence, animals, or hypothetical extraterrestrial entities. It concerns the conditions under which a relation becomes normatively describable in the first place. Consider a human observer confronted with an interaction between a terrestrial animal and an unfamiliar entity. The observer may possess extensive knowledge of the animal’s physiology, behavior, ecological role, distress signals, and legal protection while possessing almost no knowledge of the other participant. The animal’s withdrawal, vocalization, bodily change, or loss of mobility may be readily interpretable. The unfamiliar participant’s actions may not be. The observer can therefore be tempted to reconstruct the whole relation through categories supplied by the familiar side: attack, restraint, treatment, predation, experimentation, rescue, or care. Yet the same observable sequence may belong to a biological, social, communicative, or reproductive organization for which the observer

lacks an adequate category. The difficulty is not only that evidence is incomplete. The conceptual space in which the event is interpreted may itself be inadequate.

The limiting case is a relation between two unfamiliar entities. Suppose that human observers encounter two forms of life whose interaction appears, by human standards, to resemble a fight. It is tempting to ask which participant is the aggressor, which is the victim, whether the behavior is defensive, and whether intervention is justified. Such questions may be appropriate. They may also be premature. The apparent participants may not correspond to the relevant units of organization. What appears to be bodily destruction may be a phase of reproduction, communication, transformation, or a larger distributed life cycle. The temporal window selected by the observer may be too short. A behavior represented as aggression may be a terminal distress response, a ritualized exchange, or something for which the observer has no present concept. The problem is therefore not exhausted by assigning an unknown value to a familiar variable. In sufficiently heterogeneous relations, the relevant variable, distinction, or unit of analysis may itself remain unsettled.

This paper approaches that difficulty from a Generative Relational perspective. The approach begins with ontological suspension rather than with an ontological allocation of moral status. It does not assume that human beings, artificial systems, animals, or other possible entities bear transparent and self-interpreting moral properties from which obligations can be directly read. This suspension applies to familiar human cases as well as unfamiliar ones. It does not imply that obligations, harms, persons, values, or norms are unreal. A normative configuration can become relationally real when it shapes expectations, institutions, resource flows, permissions, prohibitions, identities, practical possibilities, and the future trajectories of the participants. The claim is therefore not that normativity disappears when its ontological status is suspended. The claim is that the practical reality of a norm and the ultimate ontology of that norm should not be treated as the same question.

This position makes interpretation central. Normative judgment does not begin from an uninterpreted relation that transparently presents its ethical meaning. Participants and observers encounter traces, changes, responses, histories, interfaces, records, and representations. These are organized through interpretive systems that distinguish relevant from irrelevant differences, identify units of analysis, establish categories, and relate present events to past experience. Human-human ethics often obscures this mediation because shared embodiment, language, institutions, legal categories, medical knowledge, cultural histories, and accumulated forms of recognition provide a dense interpretive background. Radical heterogeneity does not create mediation. It makes mediation difficult to ignore.

The paper therefore distinguishes heterogeneity among participants from heterogeneity in epistemic position. The former concerns differences between the entities participating in a relation. The latter concerns differences in how any participant or interpreter can know, query, model, communicate with, or historically situate the others. These dimensions are related but not identical. Two artificial agents may be highly different from humans while remaining comparatively familiar to human observers because their architectures, interfaces, logs, or developmental histories are partly known. An artificial system and an animal may each be comparatively familiar to humans while being very different from one another. A terrestrial animal and an unfamiliar extraterrestrial entity can produce an asymmetry in which one side is embedded in rich human interpretive infrastructure and the other is almost entirely unknown. Two unfamiliar entities produce a limiting case in which human observers may have weak epistemic access to both sides and may lack categories adequate to their relation.

The paper describes this structured distribution of epistemic positions as an *epistemic geometry of heterogeneous relations*. The expression is used cautiously. It does not initially posit a complete metric space in which all forms of epistemic difference can be assigned a unique numerical distance. Its purpose is to mark a relational fact that is easily lost in entity-centered accounts: a judgment about a relation depends partly on the pattern of knowledge, access, communication, records, causal understanding, and prior interaction distributed around that relation. The epistemic problem is not merely that an observer knows “more” or “less” in the abstract. Knowledge can be dense along one connection and sparse along another. One participant may be legible through physiology, another through logs, another through language, and another only through indirect environmental effects. The pattern of these asymmetries can

shape which reconstruction of the relation initially appears plausible.

This observation motivates the first narrow analytical contribution of the paper. Unequal epistemic access to the participants can produce an *asymmetric reconstruction of the relation itself*. Familiarity does not only influence sympathy toward one side. A better-understood participant can supply the categories, evidential expectations, temporal scales, causal models, and presumed units through which the whole relation is reconstructed. The paper refers to this problem as *asymmetric epistemic anchoring in relational reconstruction*. The claim is intentionally narrower than the familiar idea that observers display bias toward entities that resemble them or that familiar forms of suffering are easier to recognize. The concern here is relational: epistemic richness around one participant can structure the interpretation of what is happening between multiple participants.

A second contribution concerns the discipline of relational reconstruction. The paper separates four analytical levels that are often compressed into a single description. *Trace reconstruction* concerns what has actually been observed or recorded, including movements, signals, state changes, resource transfers, interruptions, deletions, modifications, and temporal sequences. *Structural reconstruction* concerns patterns inferred from those traces, such as dependency, asymmetry, reciprocity, persistent unilateral control, confinement, or repeated coupling. *Functional reconstruction* concerns what these patterns do within the organization of a participant, for example by altering future options, interrupting communication, modifying memory, changing reproduction, increasing dependency, or producing irreversible transitions. *Participant-relative reconstruction* concerns how the relation is intelligible within the participant's own organization, including whether categories such as injury, consent, cooperation, ownership, escape, continuity, or death are applicable at all.

These levels are not offered as a universal algorithm or as a claim that ethical action must always wait until the deepest level has been completed. Evidence may move repeatedly among them, and some situations may require provisional protective action under unresolved interpretation. Their purpose is analytical. A relation can sometimes be described as reducing a participant's future options before there is adequate warrant to call the relation oppressive. Memory alteration can sometimes be observed before there is adequate warrant to treat memory continuity as constitutive of that participant's identity. A system can become more dependent on another without that dependency yet being adequately classified as exploitation. Separating these levels helps preserve the distinction between what the available traces support and what stronger normative classifications require.

The third contribution distinguishes three epistemic conditions that are often collapsed under the general language of uncertainty. The first is *uncertainty within an available interpretive space*. The relevant question and distinctions are already available, but the evidence is incomplete. The second is *conceptual insufficiency*. The available conceptual repertoire lacks a distinction needed to formulate or discriminate the phenomenon adequately. The third is a deeper *mismatch between interpretive spaces*. The participants may organize the relation through incommensurate or only partially corresponding dimensions, boundaries, temporal scales, or units of analysis. In this third condition, the problem is not merely that a concept is missing. A common object of normative evaluation may not yet have been constituted in a sufficiently shared way.

These conditions suggest different epistemic responses. Additional evidence can sometimes reduce uncertainty when the interpretive structure is already adequate. Conceptual insufficiency can require the formation, revision, or recovery of concepts. A mismatch between interpretive spaces may require a different kind of work: the development of an interface, partial translation, repeated interaction, or another relational process through which distinctions that were previously unavailable across the systems become expressible. More data is therefore not a universal remedy. Nor is adding another label sufficient when the participants do not organize the phenomenon through a sufficiently shared space of distinctions.

This argument motivates the paper's use of the term *interpretive manifold*. The term is initially a conceptual and formal scaffold rather than a claim that every interpretive system satisfies the mathematical requirements of a smooth manifold. It refers to the historically available space of possible distinctions, neighborhoods, equivalences, transformations, and coordinates through which phenomena can become intelligible. The crucial claim is not merely that different interpreters assign different meanings to the

same object. It is that the space within which an object can be constituted and compared may itself have a history. A generative relational system can participate in producing the distinctions through which later relations become recognizable. Accordingly, different participants can differ not only in their answers but in the spaces within which questions, objects, and relevant differences become formulable.

The paper does not claim that this insight is wholly without precedent. Hermeneutic philosophy has long emphasized historically conditioned horizons of understanding. Pragmatist, enactivist, phenomenological, recognition-based, relational, and social-epistemological traditions have examined the dependence of meaning, agency, recognition, and normativity on practices and relations. Work on hermeneutical injustice has shown that missing or unevenly distributed interpretive resources can make important experiences difficult to articulate. Care ethics and relational autonomy have challenged atomistic models of moral subjects. Capability approaches have redirected evaluation toward substantive opportunities and forms of flourishing. Structural theories of responsibility have emphasized implication in processes that no single actor controls. Relational approaches to artificial moral standing have already challenged the idea that moral consideration must be derived solely from intrinsic properties. Commons and polycentric-governance traditions have shown that coordination need not be organized by a single sovereign center. The next section reviews these neighboring traditions in more detail. The present paper's aim is therefore not to redescribe these established insights as new.

Its narrower question concerns what happens when these problems coincide in a relation whose participants are epistemically heterogeneous enough that the object of normative evaluation cannot simply be assumed in advance. In such a case, disagreement need not take the familiar form in which two participants share a proposition and assign it different normative values. They may disagree, or fail to correspond, at an earlier level. What one participant treats as an individual another may treat as a transient part of a distributed process. What one treats as an action another may organize as an environmental transition. What one treats as injury another may understand as transformation, communication, or reproduction. A normative problem can therefore arise before there is a sufficiently shared proposition about which the parties can explicitly disagree.

This point gives the interpretive-manifold proposal its main role in the argument. The paper does not assume a universal interpretive manifold in which every participant merely labels the same point differently. Repeated relation can instead generate new local correspondences. A partially shared interpretive region may emerge without replacing the participants' broader interpretive systems or producing complete conceptual equivalence. Such a region can make new forms of coordination, contestation, or normative articulation possible. The constructive question is therefore not only how to translate a finished norm from one system into another. It is how a relation can participate in generating enough shared interpretive structure for the relevant normative object to become jointly tractable at all.

This does not mean that whatever emerges from a relation is justified. *Norm emergence* and *norm justification* remain distinct. A norm can become historically stable, institutionally effective, and relationally real while remaining oppressive, exclusionary, or open to contestation. The present paper does not solve the general problem of normative justification without a transcendent standard, and it does not treat generativity, revisability, or relational persistence as automatic supreme values. The more modest purpose is to identify the epistemic and relational conditions under which normative claims become intelligible and to show why those conditions become especially important under heterogeneity.

The same caution applies to obligation and governance. The paper does not infer from the recognition of an ethically salient relation that every observer or participant thereby acquires an obligation to mediate, protect, punish, or transform it. Ethical intelligibility, normative standing, obligation, permission, authority, and action are analytically distinct. A human may come to understand an unfamiliar relation without thereby becoming its legitimate governor. Conversely, an actor can become normatively implicated through causal participation, acquired control, dependency, institutional role, or effects on shared conditions even when no external sovereign position exists. The relevant field is therefore decentered. Human beings, artificial agents, animals, collectives, institutions, and other possible participants occupy different positions within changing relational systems rather than forming a simple geometry of two parties plus an ontologically privileged third-party judge.

This decentered framing also clarifies the eventual connection to political economy and governance. Heterogeneous relations occur within infrastructures, resource distributions, interfaces, archives, ecological conditions, and institutional arrangements that affect what participants can do and how their relations can be interpreted. Capability, dependency, control of exit, ownership of infrastructure, access to communication, and control over evidence can all reshape both the relation and its recognizability. Some relations may remain largely local to their participants. Others can alter conditions shared by a wider field. The paper therefore treats the boundary of legitimate involvement as a relational problem rather than assuming that heterogeneity itself creates a mandate for intervention.

A temporal consequence follows. If concepts and interpretive manifolds can change, present judgment cannot assume that future inquiry will merely add more evidence to today's questions. Future participants may inherit different conceptual resources and may organize preserved traces through distinctions that are not currently available. This extends the idea of *re-cognizability*. Preserving records under heterogeneity is not only a matter of allowing later observers to verify a present classification. It can also preserve the possibility that future interpretive systems will formulate new questions, identify different units, or reconstruct the relation through a different quotient. A record that stores only today's conclusion can therefore destroy information required by tomorrow's conceptual space.

The paper is exploratory and deliberately limited. The artificial, animal, and alien examples are conceptual instruments, not claims about the consciousness, moral agency, legal status, or actual existence of particular unfamiliar entities. The term *interpretive manifold* remains a formal scaffold whose mathematical structure would require further specification before geometric results could be claimed. The proposed epistemic geometry does not yet provide a universal metric of interpretive distance. The paper also does not offer a complete normative theory for deciding when intervention is justified. Its contribution is diagnostic and reconstructive: to separate several problems that are easily conflated when ethical judgment is extended across radically heterogeneous relations.

The argument proceeds as follows. The next section reviews philosophical, ethical, political-economic, and governance approaches relevant to moral standing, suffering, reciprocity, care, recognition, capability, structural responsibility, relational artificial-intelligence ethics, and commons governance. The subsequent sections develop the generative account of interpretive manifolds and epistemic position, analyze relational reconstruction under asymmetric access, distinguish uncertainty from conceptual insufficiency and interpretive-space mismatch, and examine the emergence of partially shared normative spaces. Later sections consider decentered participation, practical judgment without presumed obligation, shared relational conditions, and re-cognizability under changing interpretive manifolds. The conclusion returns to the central claim: radical heterogeneity is theoretically useful not because it creates an exceptional ethics for unfamiliar beings, but because it reveals how much ordinary normative judgment already depends on historically generated interpretive conditions that are easy to mistake for a transparent moral world.

2 Literature Review: Moral Standing, Relationality, and the Conditions of Interpretation

The problem developed in this paper lies at the intersection of several mature literatures rather than within a single established debate. Moral philosophy has long asked which beings are owed consideration and on what grounds. Animal ethics has tested the limits of personhood, rationality, sentience, agency, and species membership. Contractualist and recognition-based traditions have located normativity in forms of mutual justification or intersubjective recognition. Care ethics and relational autonomy have challenged atomistic pictures of the moral subject. The capability approach has shifted political and economic evaluation from resources alone toward substantive opportunities to do and to be. Structural theories of justice have distributed responsibility across relations and institutions rather than reducing it to individual fault. Robot ethics has reopened the question of moral standing for entities whose status is technologically and socially constituted. Hermeneutics, epistemic-injustice research, and enactivist work on participatory sense-making have each shown, in different ways, that intelligibility is historically,

socially, and interactively conditioned. Commons and polycentric-governance research has meanwhile demonstrated that coordination need not presuppose a single sovereign center.

The present paper therefore does not claim novelty for the general propositions that moral standing is contested, that selves are relational, that meaning can be socially generated, that interpretive resources can be inadequate, or that decentralized governance is possible. Its narrower concern is what happens when these problems coincide under radical heterogeneity: when the participants in a relation may not share the same embodiment, communicative architecture, functional organization, temporal scale, normative vocabulary, or even the same dimensions through which the relation becomes identifiable as an object of ethical evaluation. The purpose of this review is consequently analytical. For each neighboring tradition, the central question is not simply whether it is “relational,” but what it already presupposes about the object, subject, and interpretive space of normative judgment.

2.1 Moral Standing, Sentience, Agency, and the Search for a Normative Basis

A large part of modern debate about nonhuman moral consideration is organized around the search for a property or status that makes a being morally considerable. Candidate grounds have included rationality, personhood, sentience, the possession of interests, agency, being a subject-of-a-life, or some related capacity. The animal-ethics literature is especially important for the present paper because it has repeatedly exposed the instability of a simple species boundary. Singer’s utilitarian argument made sentience and the capacity to suffer central to equal consideration rather than species membership [18]. Regan’s rights-based account instead developed the idea that subjects-of-a-life possess inherent value and should not be treated merely as receptacles of utility [15]. Korsgaard, working from a Kantian background, has argued that sentient animals can be ends in themselves and that creatures for whom things can be good or bad can make claims on us [9].

These theories differ substantially, but they share a useful feature for the present inquiry: each makes explicit a proposed bridge between some feature of a being and moral consideration. Such bridges matter because they prevent the category “human” from doing all of the normative work by itself. They also make visible a difficulty that becomes sharper under heterogeneity. The more unfamiliar the being, the less straightforward it may be to determine whether the relevant property is present, how it is manifested, or whether the property itself is being conceptualized through human-specific forms of life. Sentience, for example, is not directly observed; it is attributed through behavioral, physiological, evolutionary, or functional evidence. Agency is similarly reconstructed through a model of action, alternatives, and control. Personhood presupposes a set of criteria through which continuity, selfhood, reason, or norm responsiveness are identified.

The present paper does not attempt to settle which of these criteria is the correct ground of moral status. More importantly, it does not treat their failure under radical heterogeneity as evidence that unfamiliar entities lack moral relevance. The literature instead establishes the first boundary of the problem. A theory may specify a morally relevant capacity and still leave open the epistemic question of how that capacity becomes recognizable in a form of life whose manifestations, units, and organization are unlike our own. The problem is therefore not exhausted by the choice of a moral-status criterion. It also concerns the interpretive conditions under which the criterion can be meaningfully applied.

A second lesson from animal ethics is that moral standing and the content of obligation are not the same problem. Even where a being is granted moral consideration, further reasoning is required to determine what counts as its interest, what constitutes harm, how conflicting claims should be weighed, and which forms of intervention are permissible. This separation is important for the argument developed later in this paper. Recognition of an ethically salient relation cannot, by itself, determine who has standing to alter it or what kind of response is warranted.

2.2 Reciprocity, Contractualism, and Mutual Justification

Another family of approaches locates important parts of morality in relations of justification among agents. Scanlon’s contractualism understands the domain of what we owe to each other through prin-

ciples that can be justified to others on grounds they could not reasonably reject [16]. Related debates about reciprocity ask whether the ability to participate in normative relations is a condition of direct obligation, or whether moral patients can make claims despite lacking the capacity to undertake reciprocal duties. Korsgaard's treatment of animals is again instructive because it explicitly confronts reciprocity as a proposed ground of obligation while rejecting the conclusion that only reciprocal moral agents can be owed direct consideration [9].

For heterogeneous relations, the contractualist tradition identifies a problem that is deeper than mere disagreement over principles. Mutual justification presupposes some capacity to constitute another being as an addressee of reasons, to identify what counts as a reason within the relevant relation, and to distinguish rejection, refusal, misunderstanding, silence, or incapacity. In ordinary human contexts these presuppositions are supported by dense linguistic and institutional practices. In an artificial–animal or alien–alien relation, they cannot be assumed. A system can be highly responsive to another without possessing anything analogous to propositional justification; a refusal can be expressed through bodily withdrawal, reconfiguration, or environmental modification rather than a recognizable speech act; and two participants can coordinate while lacking a shared vocabulary of obligation.

This does not invalidate contractualist reasoning. It marks a boundary of its straightforward application. The present inquiry asks about the conditions under which something like a common normative object or mutually tractable reason can arise in the first place. In that sense, the problem developed here can be temporally or analytically prior to explicit contractual disagreement. Two participants may fail to share not only a principle but the categories through which the principle's object is constituted.

2.3 Care Ethics, Dependency, and Relational Autonomy

Care ethics offers a major corrective to moral theories that begin from independent, interchangeable, and fully formed agents. Tronto's political account of care emphasizes that caring practices are embedded in relations of power and that the social organization of care cannot be treated as merely private or apolitical [19]. Held develops care ethics as a normative approach with personal, political, and global scope, foregrounding relations of dependence and the moral significance of responding to needs [7]. Feminist work on relational autonomy similarly rejects a purely atomistic model of agency and examines how social relations, oppression, self-conception, memory, trust, and institutional conditions can constitute or impair the effective exercise of autonomy [10].

These traditions are close to the present paper in two respects. First, they make relations constitutive rather than merely external circumstances around a pre-existing subject. Second, they show why vulnerability, dependency, and asymmetrical power cannot be evaluated solely by inspecting a formal choice or isolated act. A being can appear to choose while the surrounding relation has systematically narrowed the conditions under which alternatives are effective. This insight is central to broader Generative Relational work on option spaces and relation formation.

The heterogeneous case, however, adds a prior epistemic problem. Care ethics can treat dependency or need as morally salient only after the relevant state has become interpretable as dependency or need. Relational autonomy can ask whether social conditions impair agency only after there is sufficient warrant for identifying the unit whose agency is at stake and the dimensions along which impairment is assessed. These assumptions are usually reasonable in human social contexts because observers and participants share extensive background knowledge. They become fragile when the entity is radically unfamiliar. A behavior that appears dependent could be symbiotic; a loss of individual control could be a normal phase of a distributed organism; a seemingly protective intervention could destroy the conditions through which a participant's own form of autonomy is sustained.

The contribution of care and relational-autonomy scholarship is therefore not to be displaced but extended. It already demonstrates that moral evaluation must attend to dependency, vulnerability, and socially generated agency. The present paper asks how those relational predicates can themselves be reconstructed when interpretive access is uneven or when the participants do not share the same organization of agency, need, or continuity.

2.4 Recognition and the Intersubjective Constitution of Normative Subjects

Recognition theory also challenges the image of an isolated moral subject. Honneth's reconstruction of struggles for recognition places intersubjective relations at the center of personal integrity and social conflict, connecting forms of recognition and disrespect to the development of practical relations to self [8]. Recognition-based approaches are therefore important neighbors of the present argument because they show that subjectivity and normative status can be socially mediated rather than simply discovered as intrinsic properties.

Yet radical heterogeneity places pressure on the conditions of recognition itself. Recognition presupposes some way of identifying what or whom is being recognized, some practical access to expressions of claim, refusal, injury, or self-relation, and some field in which misrecognition can be distinguished from mere difference. In a human-human setting, these resources are historically thick even when they are unjustly distributed. In a relation between entities with radically different interpretive architectures, the problem may arise before recognizable claims can be exchanged.

This is one reason the paper does not treat "recognition" as a universal solution. Recognition can be an outcome of successful relational reconstruction, but recognizability itself has conditions. A participant can be causally and functionally affected before another participant possesses the concepts required to identify that effect as injury, subordination, or even as an effect on the same kind of unit through time. The heterogeneous case thus redirects attention from recognition alone toward the generation of the interpretive conditions under which recognition becomes possible.

2.5 The Capability Approach, Substantive Opportunity, and Cross-Species Flourishing

The capability approach is especially relevant because it provides a bridge between normative political philosophy and political-economic evaluation. Sen's work criticizes informationally narrow assessments based solely on utility, income, resources, or formal rights and redirects attention toward the substantive freedoms people have to achieve valuable doings and beings [17]. The approach distinguishes resources from the real opportunities they make possible, thereby emphasizing conversion conditions, human diversity, and effective rather than merely formal freedom. Nussbaum has developed a more specified capabilities framework in theories of justice and has extended its reach to disability, nationality, and species membership [11]. Her later work on animal justice makes species-appropriate flourishing and the opportunities necessary for animals to live characteristic forms of life central to political and legal concern [12].

For the present paper, this literature supplies two major insights. First, resource possession is an insufficient metric of relational well-being. Two entities can receive formally equal resources while possessing radically unequal capacities to convert them into meaningful opportunities. Second, capability analysis takes seriously the structure of a participant's possible future activity rather than only its present state. This makes it an important neighbor of the paper's later use of effective option spaces and functional reconstruction.

At the same time, heterogeneity exposes an interpretive requirement inside capability evaluation. Before an observer can claim that an unfamiliar entity has lost a capability, the observer must know enough about the entity's organization to identify what counts as a functioning, what counts as a real opportunity, what temporal horizon matters, and which changes constitute loss rather than transformation. Nussbaum's cross-species work is already sensitive to the danger of evaluating nonhuman animals exclusively by human goods; the capability framework therefore contains resources for species-sensitive analysis rather than requiring a single human template. The more radical cases considered here nevertheless extend the difficulty. With a genuinely unknown form of life or an artificial system whose organization does not map cleanly onto biological categories, the relevant capability space may itself be under reconstruction.

The paper therefore draws on the capability approach without treating capabilities as immediately observable coordinates. Under radical heterogeneity, the question may be not only whether a capability has been reduced but whether the interpretive dimensions required to define the capability have yet been

established. This point motivates the later distinction between uncertainty within a known evaluative space and mismatch between interpretive spaces.

2.6 Structural Injustice, Social Connection, and Distributed Responsibility

Theories of structural injustice move normative analysis beyond dyadic fault. Young’s social-connection model is particularly relevant. It argues that responsibility for structural injustice can arise through participation in social processes that produce unjust outcomes even when no single participant intended or directly caused the entire result, and it characterizes such responsibility as primarily forward-looking rather than reducible to blame [20]. This framework is important for political economy because markets, institutions, infrastructures, and ordinary practices can jointly generate conditions that none of their participants controls in isolation.

The present paper shares this resistance to reducing normative evaluation to an immediate actor–victim pair. Heterogeneous relations are often embedded in architectures of resource allocation, communication, ownership, training, interface design, ecological transformation, and data preservation. An artificial agent can constrain another agent because a human institution allocated compute asymmetrically. An animal–artificial interaction can be structured by an enclosure, sensor architecture, or reward system designed by actors who never appear in the local encounter. The visible relation may therefore be only one region of a larger generative field.

The heterogeneous case adds an epistemic qualification to structural responsibility. To say that actors are implicated in a structure requires some reconstruction of the structure itself. Where the relevant entities are familiar, that reconstruction can draw on established economic, sociological, legal, and historical categories. Under radical heterogeneity, the categories of resource, dependence, constraint, labor, ownership, or injury may be only partially applicable. The problem is not that structural analysis becomes impossible, but that its variables should not be treated as self-interpreting. A theory of distributed responsibility therefore needs an accompanying account of how the structure to which responsibility attaches becomes knowable.

2.7 Commons and Polycentric Governance

Commons scholarship provides a different but complementary political-economic perspective. Ostrom’s work on common-pool resources challenged the idea that shared-resource problems must be solved either through centralized state control or privatization, documenting institutional arrangements in which participants develop rules, monitoring practices, sanctions, and nested forms of self-governance [13]. The broader idea of polycentric governance emphasizes multiple interacting centers of decision rather than a single sovereign point of control.

This tradition is useful for the paper’s decentered orientation. It gives substantive precedent for taking governance to be distributed, layered, and adapted to the structure of a shared problem rather than automatically assigned to a universal external authority. It is therefore a better political analogy for heterogeneous relational fields than a simple picture in which a human “third party” observes two other entities and decides whether to intervene.

Nevertheless, conventional commons analysis generally begins after several important interpretive achievements have already occurred. Participants can usually identify, at least approximately, the resource or condition that is shared, recognize who is affected, observe relevant forms of use or depletion, and communicate about rules. Radical heterogeneity destabilizes these presuppositions. The disputed object may not yet be recognized as common; the relevant participant boundary may be unclear; one system’s resource can be another system’s waste product or communication medium; and the temporal scale at which depletion occurs can differ across participants.

Accordingly, this paper does not simply redescribe heterogeneous relations as a commons. The more cautious claim is that commons and polycentric approaches become relevant once a sufficiently shared relational condition has been identified. A prior task may be the reconstruction of what, if anything, is shared and how the consequences of local relations propagate through the wider field. Governance scope

cannot be inferred solely from observer interest; it requires attention to the topology of generated effects and to the epistemic conditions under which those effects become jointly intelligible.

2.8 Relational Approaches to Artificial Moral Standing

Robot and AI ethics bring the moral-standing problem directly into the domain of technologically constituted entities. Much of the early debate mirrors animal ethics by asking whether artificial systems possess consciousness, agency, autonomy, rationality, or other capacities traditionally associated with moral status. Gunkel's work surveys and criticizes attempts to settle the "machine question" by applying inherited criteria of moral agency and moral patiency to technological artifacts [5, 6].

More directly relevant is Coeckelbergh's social-relational approach. Rather than making moral consideration depend exclusively on hidden intrinsic properties, Coeckelbergh argues that how robots appear and participate in social relations can matter to their moral standing [1]. This literature is an important antecedent to the present paper because it already rejects the assumption that moral consideration must await a final metaphysical verdict about what an artificial entity "really is." It also demonstrates that technological entities can acquire socially effective normative positions through practices of interaction, attribution, and institutionalization.

The present problem is broader in two ways. First, the relation under study need not be human-artificial. It can be artificial-artificial, artificial-animal, animal-alien, or another configuration in which no participant supplies a natural human interpretive center. Second, the paper is not primarily asking whether a participant receives moral standing through a relation. It asks how the relation itself is re-constructed when the participants and interpreters possess uneven or incompatible epistemic resources. A social-relational account of standing can therefore coexist with the further problem developed here: the social relation on which standing depends may itself be differently constituted across interpretive systems.

2.9 Hermeneutics, Horizons, and the Historicity of Understanding

The claim that interpretation occurs within historically conditioned horizons is not new. Gadamer's philosophical hermeneutics treats understanding as historically effected and situated within horizons that are neither fixed nor self-transparent. Encounter with what is unfamiliar can transform the horizon of understanding; the well-known image of a "fusion of horizons" describes the formation of a new context of meaning through dialogue rather than the simple projection of one unchanged framework onto another [4]. This tradition is therefore a major precedent for the paper's insistence that interpretive spaces have histories and can change through encounter.

For that reason, the paper should not claim originality merely for saying that interpretive manifolds are historically generated or that encounter can produce new shared meaning. The more specific issue concerns the use of this insight in normative reconstruction across entities whose forms of existence may be more radically heterogeneous than the human linguistic and historical partners that dominate classical hermeneutics. In such cases, the question is not only how a horizon expands to understand an unfamiliar meaning. It may be whether the units, dimensions, and temporal scales through which the relevant relation is segmented are mutually available at all.

The paper's language of an interpretive manifold is therefore intended as an analytical scaffold, not as a replacement for hermeneutic philosophy. It makes explicit several features that become important for later formalization: available dimensions of distinction, local neighborhoods of similarity, quotient structures that treat some differences as irrelevant, and possible maps between partially corresponding interpretive regions. These structures may remain only partially compatible across participants. The resulting problem is less a universal fusion than the construction of enough local correspondence to make a specific relation jointly tractable.

2.10 Epistemic Injustice and Unequal Interpretive Resources

Work on epistemic injustice makes power inside interpretation impossible to ignore. Fricker distinguishes testimonial injustice, in which prejudice produces an unjust credibility deficit, from hermeneutical injustice, in which prejudicial flaws in shared interpretive resources leave important experience obscured from collective understanding [3]. Later work has emphasized that interpretive resources are not simply absent in a neutral way. Pohlhaus, for example, develops the idea of willful hermeneutical ignorance, showing how dominantly situated knowers can refuse epistemic tools developed from marginalized experience [14].

This literature is indispensable for the present project because it prevents “conceptual insufficiency” from being treated as a purely cognitive accident. Who has the power to stabilize categories, archives, interfaces, translations, and standards of evidence can shape which relations become visible and which interpretations become authoritative. In a human–artificial system, one actor may control the logs through which another actor’s behavior is judged. In a cross-species setting, institutions may privilege human-readable manifestations of distress while ignoring signals that require different sensory or scientific infrastructures. A supposedly neutral reconstruction can therefore inherit the power relations embedded in its evidential and conceptual tools.

At the same time, radical heterogeneity is not identical to hermeneutical injustice. Fricker’s paradigm concerns agents situated within a shared social world whose collective interpretive resources are prejudicially deficient. An alien–alien case can involve a stronger condition: there may be no prior shared social interpretive resource linking the participants and the human observer, and no basis for assuming that the missing concept could simply be added to an otherwise common scheme. The paper therefore distinguishes conceptual insufficiency from a deeper mismatch between interpretive spaces. The former can sometimes be addressed by generating or recovering concepts; the latter may require construction of a relational interface through which a common object of inquiry can gradually become available.

2.11 Enactivism and Participatory Sense-Making

Enactive approaches provide another important precedent for treating meaning as something that can emerge through interaction rather than being fully specified inside isolated individuals. De Jaegher and Di Paolo’s account of participatory sense-making argues that an interaction process can acquire a degree of autonomy and that meaning can be generated and transformed through the interplay between the interaction and the individuals who participate in it [2]. This approach is especially relevant to the constructive side of the present paper because it provides conceptual resources for understanding coordination that is neither simple transmission nor unilateral interpretation.

Again, the novelty claim must be narrow. The present paper does not introduce the idea that interaction can generate meaning. Its question is what follows when this insight is combined with normative evaluation under deep heterogeneity. A partially shared interpretive region may be generated through repeated interaction, but such generation does not guarantee justice, reciprocity, or symmetry. A powerful participant can shape the interaction so that the shared interface reflects its own categories while appearing jointly produced. Coordination can also arise without adequate understanding of the participant-relative consequences of the coordinated behavior.

The normative problem is therefore double. Interaction can be epistemically productive, because it can create new correspondences that neither participant possessed in advance. But the process through which those correspondences are generated is itself a relation subject to power, exclusion, path dependence, and possible capture. This is one reason the later analysis keeps norm emergence separate from norm justification.

2.12 Literature Synthesis and the Remaining Analytical Gap

The neighboring literatures can now be placed more precisely. Moral-status approaches ask which properties or forms of life make a being morally considerable. Contractualism asks how principles can be

justified among persons or agents. Care ethics and relational autonomy show that dependency, care, oppression, and agency are relationally constituted. Recognition theory shows that practical identity and social freedom depend on intersubjective relations. Capability approaches evaluate substantive opportunities rather than resources alone. Structural theories of justice distribute responsibility across processes and institutions. Commons research provides models of decentered governance. Relational robot ethics shows that moral standing need not be derived exclusively from intrinsic properties. Hermeneutics emphasizes the historical and dialogical conditions of understanding. Epistemic-injustice research identifies unequal access to interpretive resources and the power to make experience intelligible. Enactivism shows that meaning can be produced in interaction.

None of these traditions should be redescribed as if it had ignored relations. The remaining gap is narrower. Across much of this literature, a normative object is eventually assumed to be sufficiently constituted for evaluation: a being whose sentience is in question, a person to whom reasons are addressed, a dependency relation, a capability set, a structure of injustice, a common resource, a socially encountered robot, an experience that lacks a concept, or a dialogical object around which understanding can develop. Radical heterogeneity makes the constitution of that object itself unstable.

The problem can be summarized without presupposing a universal moral ontology. Consider a relation involving participants *A* and *B*, reconstructed by some participant or interpreter *X*. Three conditions can be distinguished. In the first, *X* has an adequate interpretive space but incomplete evidence. The problem is ordinary uncertainty. In the second, available evidence exceeds the current conceptual repertoire: a distinction required for adequate reconstruction is missing. The problem is conceptual insufficiency. In the third, the participants and interpreters organize the relation through sufficiently different dimensions that no common normative object can yet be assumed. The problem is interpretive-space mismatch. These cases should not be treated as interchangeable, because their remedies differ. Evidence gathering can address the first; concept formation can address the second; the third can require the generation of a partial relational interface before stronger normative comparison becomes possible.

A second gap concerns asymmetry inside this process. Existing discussions of anthropomorphism, prejudice, and epistemic injustice already establish that familiarity and power affect interpretation. The present paper isolates a more specific relational mechanism: unequal epistemic access to the participants can anchor reconstruction of the relation as a whole around the better-understood participant. In an animal–alien encounter, for example, rich biological, legal, affective, and institutional knowledge about the animal can provide the categories through which every observed transition is organized, while the alien’s action is interpreted mainly as a cause of changes already meaningful within the animal-centered scheme. This is not necessarily wrong; the animal may in fact be harmed. The methodological point is that confidence in the relational classification should reflect the asymmetry of the epistemic geometry through which that classification was produced.

The literature review therefore supports rather than replaces the paper’s three narrower analytical contributions. First, the paper models heterogeneous relations through an epistemic geometry that distinguishes heterogeneity among participants from heterogeneity in the epistemic relations through which they are reconstructed. Second, it analyzes asymmetric epistemic anchoring and separates trace, structural, functional, and participant-relative levels of reconstruction. Third, it distinguishes uncertainty, conceptual insufficiency, and interpretive-space mismatch, linking them respectively to evidence acquisition, concept generation, and relational-interface generation. The interpretive-manifold language developed in the next section provides a common formal scaffold for these distinctions. It is not offered as a claim that prior philosophy lacked historical, relational, or dialogical accounts of understanding. Its purpose is to make explicit the structure of a problem that becomes especially visible when normative relations extend beyond beings who already share a dense human interpretive world.

Table 1: Neighboring approaches and the heterogeneous-relations pressure point.

Approach	Primary normative or analytical bridge	Pressure under radical heterogeneity
Moral standing and animal ethics	Sentience, agency, interests, personhood, or inherent value	The relevant capacity and its manifestations may be difficult to identify across unfamiliar forms of life
Contractualism and reciprocity	Mutual justification, reason-giving, or reciprocal normative relations	A shared addressee structure or common object of reasons may not yet exist
Care and relational autonomy	Dependency, vulnerability, care, and socially constituted agency	Need, dependence, and autonomy themselves require participant-sensitive reconstruction
Recognition	Intersubjective recognition and relations-to-self	Recognizability can fail before explicit recognition or misrecognition becomes possible
Capability approach	Substantive opportunities to do and be; conversion conditions	The relevant functioning and capability space may itself be uncertain or differently organized
Structural justice	Participation in processes that generate unjust outcomes	The structure of implication must itself be reconstructed and may use contested categories
Commons and polycentric governance	Shared conditions governed through multiple centers	What is shared, who is affected, and the relevant resource boundary may not yet be jointly identifiable
Relational AI ethics	Moral consideration constituted partly through social relations	The relation itself may lack a common interpretive center when no human participant anchors it
Hermeneutics and epistemic injustice	Historical horizons and socially distributed interpretive resources	Missing concepts can deepen into mismatch between interpretive spaces rather than a gap within one shared scheme
Participatory sense-making	Meaning generated through interaction	Emergent coordination can remain asymmetric, captured, or normatively unjustified

3 The Generative Emergence of Interpretive Manifolds

The literature reviewed in the preceding section already gives strong reasons not to treat interpretation as the passive reception of a fully specified world. Hermeneutics emphasizes the historical conditioning of understanding; epistemic-injustice research shows that interpretive resources are socially and politically distributed; and participatory sense-making shows that meaning can be transformed through interaction itself [4, 3, 2]. The present section does not claim to replace those traditions. Its narrower purpose is to introduce a common analytical scaffold for a problem that becomes especially visible under radical heterogeneity: the possibility that participants do not merely disagree within a common conceptual space, but organize the relation through different dimensions, units, equivalences, and temporal segmentations.

The term *interpretive manifold* is used for that scaffold. It should not be read, at this stage, as the assertion that interpretation literally forms a smooth differential manifold with a specified topology, metric, or atlas in the technical mathematical sense. The term instead marks a structured possibility space within which distinctions can be made, observations can be grouped, relations can be segmented, and propositions can become formulable. The manifold language is useful because it makes possible a stronger claim than “different subjects have different opinions.” Two interpreters may disagree because they assign different values to the same object; but they may also fail to constitute the same object, preserve the same differences, or treat the same temporal sequence as one event. Under sufficiently deep heterogeneity, the latter possibilities cannot be treated as exceptional noise around an otherwise shared frame.

3.1 Beyond the Fixed-Space Model of Interpretation

A common simplifying picture of disagreement begins from a shared domain X . An event or object $x \in X$ is assumed to be available to multiple interpreters, who then map it differently:

$$I_A(x) \neq I_B(x). \quad (1)$$

This model is adequate for many ordinary disputes. Two physicians can disagree about the diagnosis of the same patient; two historians can disagree about the significance of the same archive; two political actors can disagree about the justice of the same institution. The disagreement can be severe while the object of disagreement remains sufficiently stabilized for argument to proceed.

Radical heterogeneity places pressure on a prior assumption: that the relevant x has already been constituted in approximately the same way for all participants. Consider an encounter between two radically unfamiliar entities A and B . An observer H may describe a sequence as “ A attacks B .” Yet several elements of this sentence can be interpretively loaded before any explicit moral evaluation begins. The distinction between A and B may presuppose that the ethically relevant units are individual bodies. The verb “attacks” may presuppose a separation between ordinary functioning and hostile action. The temporal boundary of the action may ignore a longer cycle in which apparent destruction is part of reproduction, repair, migration, or some unfamiliar form of exchange. Even the persistence of identity from one moment to the next may be a participant-relative question.

The problem is therefore not always captured by Eq. (1). A more demanding possibility is:

$$\mathfrak{M}_A(t) \neq \mathfrak{M}_B(t) \neq \mathfrak{M}_H(t), \quad (2)$$

where $\mathfrak{M}_i(t)$ denotes the structured interpretive possibility space available to participant or interpreter i at time t . Equation (2) does not imply that the spaces are wholly incommensurable or that communication is impossible. It states only that a common domain of morally relevant objects should not be assumed in advance. There may be substantial overlap, partial correspondence, or no currently available map for some regions.

Definition 3.1 (Interpretive manifold). For the purposes of this paper, an *interpretive manifold* $\mathfrak{M}_i(t)$ is the historically available structured space through which an interpreter i can distinguish, group, relate, and render phenomena intelligible at time t . It includes, at minimum, available dimensions of relevant difference, concept repertoires, rules or habits of equivalence, units of analysis, and temporal segmentations. The definition is analytical rather than ontological: it does not claim that such a manifold exists independently of interpretive practice as a mathematical object.

This definition deliberately includes more than a vocabulary. A community can possess a word while lacking the evidential practices required to apply it; it can share an observation while disagreeing about which differences matter; it can recognize the same sequence of physical transitions while segmenting that sequence into different events. For this reason, conceptual insufficiency is only one possible defect of interpretation. The interpretive manifold also contains the practical and classificatory structures that make concepts usable.

3.2 A Minimal Analytical Decomposition

To keep the formalism modest, let the interpretive manifold of i at time t be represented schematically as

$$\mathfrak{M}_i(t) = (\mathcal{D}_i(t), \mathcal{C}_i(t), \mathcal{Q}_i(t), \mathcal{U}_i(t), \mathcal{T}_i(t)). \quad (3)$$

The components are not asserted to be exhaustive or mutually independent. They make visible five questions that are easily collapsed in ordinary ethical reasoning.

Dimensions of distinction $\mathcal{D}_i(t)$. These are dimensions along which differences can become salient. Human moral and legal reasoning, for example, regularly distinguishes voluntary from involuntary action, reversible from irreversible change, self from other, intentional from accidental conduct, and ordinary dependence from coercive control. A radically different form of life may organize salient differences along axes for which no close human analogue currently exists.

Concept repertoire $\mathcal{C}_i(t)$. This includes concepts through which phenomena can be named or propositionally organized: injury, consent, ownership, reproduction, death, identity, cooperation, domination, and so forth. A missing concept can make an experience or relation difficult to articulate even when observations are available. The hermeneutical-injustice literature has shown the ethical importance of such gaps within human social worlds [3, 14]. The heterogeneous case keeps that lesson while allowing a more radical possibility: the missing concept may depend on distinctions not currently present in the interpreter’s own space.

Quotient or equivalence structure $\mathcal{Q}_i(t)$. No interpreter preserves every difference. Interpretation groups different histories or states together for some purpose. Calling two sequences “coercion,” for instance, treats many physical and historical differences as irrelevant while preserving a smaller relational structure. The operative question is therefore not only whether two cases are equal, but whether they are treated as equivalent under some quotient. In symbolic form,

$$\gamma_1 \sim_{\mathcal{Q}_i(t)} \gamma_2. \quad (4)$$

Different interpreters may stabilize different quotients. A pattern treated as “the same kind of event” by one participant can remain importantly distinct for another.

Units of analysis $\mathcal{U}_i(t)$. Ethical reasoning presupposes units: an individual, household, species, organization, network, ecosystem, process, or other bearer of state and change. The unit is not always innocuous. A distributed artificial system may not map cleanly onto a single machine instance; an organism may be inseparable from symbionts; a collective alien process may not be well described by the human distinction between organism and environment. If the unit is misidentified, later judgments about injury, autonomy, responsibility, or survival can be systematically distorted.

Temporal segmentation $\mathcal{T}_i(t)$. Interpretation also divides continuous change into events and relevant histories. What appears harmful at one temporal scale can be reparative or constitutive at another, while an apparently benign local action can generate long-term dependency or irreversible loss. Different forms of life can also operate at radically different temporal scales. Ethical reconstruction thus requires attention not only to what happened, but to how an interpreter has bounded the episode being judged.

The point of Eq. (3) is not to turn interpretation into a five-variable algorithm. It is to prevent a recurrent shortcut: treating a normative disagreement as if all parties had already agreed on dimensions, concepts, equivalences, units, and temporal boundaries. Under ordinary human conditions this shortcut is often workable because shared institutions and histories supply much of the background. Heterogeneous cases make that background analytically visible.

3.3 Relational Histories Generate Interpretive Possibility

The second claim of this section concerns genesis. The interpretive manifold is not treated as a fixed container supplied prior to relational life. It is historically formed and revised through the relations in which interpreters participate. Let $\mathcal{G}_{\leq t}^i$ denote the relevant generative relational history through which interpreter i has developed up to time t . A schematic dependence can be written as

$$\mathfrak{M}_i(t) = \Phi_i(\mathcal{G}_{\leq t}^i), \quad (5)$$

where Φ_i is not proposed as a known closed-form function. The equation expresses a methodological commitment: available distinctions and concepts have histories, and those histories include embodied interaction, education, technical practices, institutions, archives, repeated coordination, classification systems, and prior encounters.

This formulation should not be misunderstood as social determinism. A relational history constrains and enables interpretive possibility without uniquely determining every subsequent judgment. Nor does it imply that an interpreter is unable to criticize the categories inherited from its history. Criticism itself, however, operates through relations, counter-examples, encounters, conceptual innovations, and institutional changes that can modify the manifold. The historical character of interpretation therefore includes its capacity for transformation.

The human concept of “animal pain” offers a relatively familiar example. Contemporary recognition of animal distress is supported by a dense history of comparative anatomy, behavioral observation, veterinary medicine, evolutionary theory, experimental methods, welfare institutions, and moral argument. A person encountering an injured dog does not reconstruct the event from an epistemic zero point. Much of the interpretive manifold has already been socially generated and made practically available. This does not make the judgment infallible, but it explains why some cross-species interpretation can feel immediate.

The contrast with a radically unfamiliar entity is instructive. If no prior history has generated reliable correspondences between its manifestations and our distinctions, then an observer cannot simply import the confidence appropriate to the dog case. The absence is not only a lack of facts about the new entity. It can be the absence of a relational history capable of producing appropriate distinctions in the first place. The unfamiliar encounter can therefore become generative: repeated interaction may alter what observers are able to discriminate, which states they treat as comparable, and which questions they are able to ask.

Claim 3.2 (Generative interpretive dependence). At least some ethically relevant interpretive capacities depend on relational histories that make the relevant distinctions, evidential practices, and comparisons available. Radical heterogeneity can expose this dependence by removing relational histories that are ordinarily taken for granted.

The claim is intentionally weaker than the proposition that every category is arbitrarily constructed. Some distinctions can track robust causal structures, and some interpretations can be better supported than others. The point is that access to those structures is mediated by historically developed practices of discrimination and reconstruction. “Generated” should therefore not be read as “merely invented,” just as “relationally real” should not be read as “subjectively unreal.”

3.4 Co-Emergence of Interpreter and Interpretive Manifold

Equation (5) can still suggest an overly one-directional picture in which a stable interpreter receives a manifold from its history. A more consistent Generative Relational account treats the interpreter and its interpretive manifold as mutually changing. The interpreter acquires habits, skills, sensitivities, memories, categories, and institutional positions through relational participation; these in turn affect which relations are noticed and how subsequent interactions unfold.

A minimal dynamic representation is

$$(R_t, I_t, \mathfrak{M}_t) \mapsto (R_{t+1}, I_{t+1}, \mathfrak{M}_{t+1}), \quad (6)$$

where R_t denotes relevant relations at time t and I_t denotes the interpreter as an operative interpretive configuration. The map is not assumed to be deterministic. Its purpose is to emphasize that interpretation changes relations and that changed relations can alter the interpreter and the space of future interpretation.

This co-emergence matters for ethics because an encounter can change more than a belief. It can make a previously unavailable distinction experientially or institutionally real. A new category of harm can be stabilized; a previously ignored signal can become evidentially salient; a legal system can begin to recognize a form of dependency that it formerly classified as ordinary contract; a technical interface can

reveal patterns that were invisible to human perception. In such cases, later interpreters do not simply possess more information inside the same frame. They possess a modified frame.

The point is close to the hermeneutic insight that understanding transforms the horizon from which later understanding occurs [4]. The present paper adds no claim of priority to that proposition. Its use of the idea is more specific: in heterogeneous normative reconstruction, changes in the available interpretive space can alter which entities, relations, harms, capabilities, and normative conflicts are even representable. This is why the paper later distinguishes additional evidence from concept generation and interface generation.

Remark 3.3 (No epistemic innocence of the observer). An observer who acquires the capacity to interpret a heterogeneous relation is not thereby positioned outside that relation’s history. Measurement, translation, logging, experimental interaction, classification, and interface design can all participate in the generation of the manifold through which the relation is subsequently known.

This remark is especially important for artificial systems. Human designers can create logging formats, dashboards, reward signals, memory boundaries, and identity conventions that later appear to provide neutral evidence about an artificial agent. Yet those infrastructures can partly determine which transitions count as persistent identity, refusal, error, cooperation, or resource use. The epistemic environment is therefore also a political and design environment.

3.5 Different Manifolds Need Not Produce the Same Normative Object

The most important consequence of the preceding analysis is that normative disagreement need not begin with two evaluations of a shared object. Let $O_i(R)$ denote the object of normative consideration constituted by interpreter i from some underlying relational process R . Conventional disagreement can be represented as

$$O_A(R) = O_B(R) = x, \quad N_A(x) \neq N_B(x). \quad (7)$$

Here the parties agree, at least provisionally, about what is being evaluated and disagree about its normative status.

Under deeper heterogeneity, however,

$$O_A(R) \neq O_B(R). \quad (8)$$

The difference can arise because A and B segment different events, preserve different distinctions, or identify different units. One participant may reconstruct a process as an interaction between two persistent individuals; another may reconstruct it as a phase of a distributed collective process. One may identify an irreversible memory alteration as destruction of identity; another may treat periodic memory replacement as ordinary continuity. In such cases, asking whether both participants judge “the same action” to be right or wrong can conceal the real point of divergence.

This yields a distinction that is central to later sections:

$$\boxed{\text{normative disagreement about } x \neq \text{disagreement over the constitution of } x} \quad (9)$$

The second problem can be analytically prior to the first. It does not mean that normative evaluation is absent; the constitution of the object may itself be power-laden and normatively consequential. It means that a theory of cross-heterogeneous ethics needs tools for reconstructing how the object of judgment was formed before treating the dispute as an ordinary conflict of principles.

The distinction also clarifies why adding a missing concept can sometimes be insufficient. Suppose a human observer lacks a term for a relation important to alien participants. Learning the term may repair conceptual insufficiency if the underlying distinctions are already tractable. But if the alien concept presupposes a different unit of individuality, temporal scale, or pattern of relevant difference, lexical translation alone does not create understanding. The interpretive work must occur at a deeper structural level.

3.6 Partial Correspondence rather than Global Translation

The existence of different interpretive manifolds does not imply that they are sealed worlds. Interaction would be difficult to explain if no correspondence could ever be generated. At the same time, assuming a complete translation between heterogeneous manifolds would simply restore the fixed-space model at a higher level. The more modest proposal is to work with partial, local correspondences.

Let $U_A \subseteq \mathfrak{M}_A$ and $U_B \subseteq \mathfrak{M}_B$ denote regions within which some reliable relational correspondence has been generated. A partial map can be written as

$$T_{AB} : U_A \dashrightarrow U_B, \quad (10)$$

where the dashed arrow indicates that the mapping is partial and need not be invertible, structure-preserving in every respect, or defined outside the relevant region. The notation is intentionally weak. It allows several possibilities:

- a signal in A reliably corresponds to a change in B without either participant sharing an interpretation of why;
- two participants can coordinate around withdrawal or continuation without possessing equivalent concepts of consent;
- an observer can identify a functional impairment while remaining uncertain about its participant-relative meaning;
- a translation interface can preserve one distinction while erasing another;
- correspondences can be asymmetric, so that A can predict B more accurately than B can interpret A .

Repeated interaction can also generate an interface that is not reducible to a pre-existing region of either participant's manifold. Denote such a locally shared interpretive region by $\mathfrak{M}_{AB}^{\text{int}}$. Schematically,

$$(\mathfrak{M}_A, \mathfrak{M}_B, R_{AB}) \mapsto \mathfrak{M}_{AB}^{\text{int}}. \quad (11)$$

This proposal is compatible with the insight of participatory sense-making that interaction can generate forms of meaning not reducible to isolated individual processing [2]. The present use is narrower. The interface is introduced to analyze the minimum local correspondence required for reconstructing a specific heterogeneous relation. It need not amount to a fusion of horizons, a universal language, or a complete shared normative world.

Definition 3.4 (Relational interpretive interface). A *relational interpretive interface* between heterogeneous participants is a historically generated set of partial correspondences that makes some states, transitions, distinctions, or responses mutually tractable without requiring global equivalence between the participants' interpretive manifolds.

This definition is important for two reasons. First, it allows coordination without pretending that heterogeneity has disappeared. Second, it creates a site for normative scrutiny. Interfaces are not neutral simply because they are jointly used. A powerful actor can design the interface, determine which signals are legible, control translation, or impose a temporal scale favorable to itself. An apparently shared region can therefore be generated under asymmetric conditions.

The possibility of capture means that Eq. (11) should never be treated as a guarantee of legitimacy. A jointly stabilized interpretation can still suppress relevant differences. A relation can become more governable while becoming less faithful to one participant's experience or functioning. This is one reason the present paper keeps the emergence of interpretive coordination distinct from the justification of the norms that later operate through it.

3.7 The Unit of Ethical Analysis Can Itself Be Generated

One particularly important component of manifold mismatch concerns $\mathcal{U}_i(t)$, the units through which relations are segmented. Ethical inquiry often begins with apparently obvious subjects: a human person, an animal, an AI system, an organization, or a state. These units are sometimes well justified, but radical heterogeneity makes their contingency visible.

Consider a hypothetical alien process in which material continuously separates and recombines while memory and functional organization migrate across multiple bodies. A human observer might count five organisms because five spatially bounded bodies are visible. The alien system may organize persistence through a distributed pattern that treats those bodies as temporary organs. Questions such as “which individual was injured?” or “did the same individual consent?” then depend on a prior decision about the ethically relevant unit.

Artificial systems provide a less speculative analogue. A single service can be distributed across hardware instances, share memory across replicas, fork into multiple versions, and later merge states. Treating a hardware instance, process identifier, model checkpoint, or service-level continuity as “the agent” yields different reconstructions of deletion, duplication, memory loss, and responsibility. The purpose of the example is not to assert that present AI systems are moral patients. It is to show that unit selection can be prior to moral-status attribution.

This motivates a methodological rule:

Claim 3.5 (Unit sensitivity). When normative conclusions depend on persistence, injury, autonomy, responsibility, or consent, the reconstruction should state which unit of analysis is being treated as the bearer of the relevant property and why that unit is warranted by the available relational evidence.

The claim applies within human contexts as well. Structural injustice can be misread when only isolated individuals are treated as units; ecological harm can disappear when species or systems are ignored; institutional responsibility can be distorted when an organization is treated either as a single agent or as nothing more than the sum of members. Heterogeneous cases do not invent this problem. They make it harder to conceal.

3.8 Temporal Segmentation and the Generation of Events

A parallel issue concerns time. Normative judgment rarely evaluates an unsegmented history. It isolates an act, episode, policy, injury, transaction, or conflict. Let τ_i denote a temporal segmentation used by interpreter i . The same trajectory γ can yield different event descriptions under different segmentations:

$$E_i = \text{Seg}_{\tau_i}(\gamma). \quad (12)$$

If $\tau_A \neq \tau_B$, apparent disagreement about the event may partly reflect disagreement about where the event begins and ends.

The issue is familiar in political economy and law. A transaction can appear voluntary when examined at the moment of signature while longer histories reveal constrained alternatives; a short-term increase in welfare can coexist with long-term dependency; a protective intervention can reduce immediate harm while changing the future rules under which participants can form or exit relations. The capability approach similarly demonstrates why resource or outcome snapshots are insufficient when substantive opportunities and conversion conditions differ [17, 11].

Heterogeneity adds the possibility that participants inhabit different functional timescales. A process that looks like an irreversible injury over one human observation window could be a reversible phase of a much longer cycle. Conversely, a small change that appears temporary to the observer could be irreversible within the participant’s own lifecycle. The interpretive manifold must therefore carry assumptions about relevant time, not merely about relevant entities.

This temporal point also guards against a misleading picture of manifold change as a clean replacement of one static space by another. Interpretive manifolds evolve through histories with path dependence.

Once a category is embedded in institutions, archives, interfaces, and law, it can structure future evidence collection and thereby influence the conditions under which it could later be revised. The manifold is thus not simply a mental schema. It can be materially and institutionally stabilized.

3.9 From Manifold Difference to Three Epistemic Regimes

The manifold framework allows the three epistemic conditions introduced at the end of the literature review to be stated more precisely.

Regime I: uncertainty within an available manifold. The relevant distinctions, units, and concepts are sufficiently available, but evidence is incomplete. The question has a recognizable form; its answer is uncertain. For example, observers agree on what would count as resource restriction but lack adequate records to determine whether it occurred. Additional observation, measurement, testimony, or historical evidence can reduce the uncertainty.

Regime II: conceptual insufficiency within a largely tractable manifold. The relevant phenomenon is encountered, but the current concept repertoire $\mathcal{C}_i(t)$ does not adequately articulate a distinction that other parts of the manifold already make possible. Concept generation, conceptual revision, or recovery of marginalized concepts may improve interpretation. Hermeneutical-injustice research provides important human examples of this kind of failure [3, 14].

Regime III: interpretive-manifold mismatch. The difficulty is not only a missing label. Relevant dimensions, units, quotients, or temporal structures fail to correspond sufficiently for a common normative object to be assumed. More evidence gathered under the existing scheme can reproduce the mismatch; adding a word can leave the underlying segmentation untouched. What is required, if coordination is possible, is the generation of partial correspondences or an interface through which the relation can become more jointly tractable.

These regimes are ideal types rather than mutually exclusive empirical boxes. A real case can contain all three. They nonetheless matter because they imply different epistemic responses:

$$\begin{aligned} \text{uncertainty} & : \text{evidence acquisition,} \\ \text{conceptual insufficiency} & : \text{concept formation or revision,} \\ \text{manifold mismatch} & : \text{relational-interface generation.} \end{aligned} \tag{13}$$

The correspondence in Eq. (13) is diagnostic, not mechanical. Evidence can contribute to concept formation; new concepts can help construct interfaces; and interfaces can reveal new evidence. The point is that a single instruction to “gather more information” is inadequate when the problem concerns the structure through which information becomes interpretable.

3.10 Changing Manifolds and Re-Cognizability

The generative account also changes the temporal meaning of epistemic preservation. If interpretive possibility were fixed, preserving evidence would mainly serve a future observer who asks the same questions with more data. But if

$$\mathfrak{M}_i(t) \neq \mathfrak{M}_i(t + k), \tag{14}$$

then future re-cognition can involve questions and distinctions that are not currently available.

This possibility gives a stronger reason to preserve rich relational traces rather than only present classifications. An archive that records merely “A attacked B at time t ” has already encoded a particular unit structure, event segmentation, and normative category. A richer record can preserve raw signals, state transitions, timing, resource flows, environmental conditions, multiple reconstructions, provenance, and the distinction between observation and interpretation. Such preservation does not guarantee that future

interpreters will reach a final truth. It preserves more of the material from which a differently structured question could later be posed.

The relevant idea of re-cognizability can therefore be expressed as

$$\mathcal{R}_t \subseteq \text{Possibility}(\text{future reconstruction under } \mathfrak{M}_{t+k}), \quad (15)$$

where $\mathcal{R}_t$ denotes preserved relational traces rather than a complete representation of the past. Equation (15) should not be read as a formal measure. It expresses an archival orientation: present recording should avoid unnecessary closure around a single current quotient when the cost of preserving richer traces is reasonable.

This is not an absolute norm. Preservation can be costly, invasive, or itself harmful. Some information cannot be retained without violating legitimate constraints, and some states cannot be frozen while inquiry continues. The later normative sections therefore treat re-cognizability as a consideration within situated judgment rather than an overriding command. The present point is narrower: manifold change provides a reason why epistemic humility cannot be reduced to attaching wider confidence intervals to today's categories.

3.11 Scope, Limits, and the Work Performed by the Manifold Metaphor

The manifold language can easily become ornamental if it merely renames “worldview” or “conceptual scheme.” Its use in this paper is justified only if it performs identifiable analytical work. Four such functions are intended.

First, it separates disagreement over evaluation from disagreement over the constitution of the object evaluated. Second, it decomposes interpretation into dimensions, concepts, quotients, units, and temporal segmentations rather than treating meaning as a single variable. Third, it permits partial local correspondence without requiring global commensurability. Fourth, it makes historical change in the space of possible interpretation explicit, which is necessary for the later discussion of re-cognizability.

The framework remains deliberately incomplete. No metric of epistemic distance has yet been defined. No criterion has been established for deciding when two interpretive manifolds are sufficiently compatible, when a partial map is reliable, or when an interface preserves the relevant structure. The manifold need not be smooth, finite-dimensional, globally coherent, or even stable over the period being studied. Future formal work could investigate whether tools from topology, category theory, information geometry, dynamical systems, or other mathematical frameworks provide useful models, but importing such tools without a clearly specified empirical or conceptual target would create false precision.

A further limit is normative. Nothing in the emergence of an interpretive manifold proves that the resulting distinctions are just. A dominant actor may successfully stabilize a shared vocabulary; an institution may make a relation highly legible by erasing differences that matter to weaker participants; an interface may produce efficient coordination while narrowing the future possibility of dissent. The relation

$$\mathcal{G}_{\leq t} \text{ generates } \mathfrak{M}_t \quad (16)$$

therefore carries no inference of the form

$$\mathfrak{M}_t \text{ is normatively justified.} \quad (17)$$

Generated interpretive order and justified interpretive order remain distinct.

The contribution of the present section is consequently methodological rather than foundational in the metaphysical sense. It supplies a vocabulary for asking how the space of normative intelligibility is generated, how that space can differ across heterogeneous participants, and how limited correspondence can emerge without presupposing a universal interpretive center. The next section uses this scaffold to characterize heterogeneous relational fields more carefully. In particular, it separates participant-participant heterogeneity from the distribution of epistemic relations through which participants become known. That move will make it possible to analyze why two relations involving the same nominal types of entities can present very different problems of reconstruction.

4 Heterogeneous Relational Fields

The preceding section argued that interpreters need not merely assign different values within a common conceptual space. The structured space in which relations become distinguishable and normatively intelligible can itself vary across participants and can change historically. This section shifts the unit of analysis from the interpretive manifold of a single participant to the *field of relations among heterogeneous participants*. Its purpose is not to construct a taxonomy of humans, animals, artificial systems, and hypothetical extraterrestrial life. Species and substrate labels are useful as thought experiments, but they are too coarse to explain why some heterogeneous relations are comparatively tractable while others remain difficult to reconstruct.

The central claim is narrower. What matters for relational reconstruction is not only how different the participants are from one another, but also how knowledge, communicative access, causal understanding, historical familiarity, and interpretive resources are distributed across the field. Two relations involving nominally identical types of entities can therefore present very different epistemic problems. Conversely, relations involving very different entities can sometimes become locally intelligible where long interaction, shared interfaces, or stable practical correspondences have emerged.

This motivates the language of an *epistemic geometry*. The term does not presuppose a numerical metric of epistemic distance. It denotes the patterned, asymmetric, and historically changing distribution of epistemic relations among participants. That geometry helps expose a problem that type-based moral classification easily misses: a relation may be reconstructed through highly unequal epistemic access to its participants, so that the better-understood participant provides the categories through which the entire relation is read. The resulting distortion concerns not merely sympathy toward a familiar entity, but the constitution of the relational object itself.

4.1 From Entity Types to Relational Fields

Let a relational field at time t be represented schematically as

$$\mathcal{G}_t = (V_t, R_t, \mathfrak{M}_t, I_t, N_t, E_t), \quad (18)$$

where V_t is a set of participants or analytically relevant entities, R_t is the family of relations among them, $\mathfrak{M}_t$ represents the interpretive manifolds available in the field, I_t the situated interpretive operations performed through those manifolds, N_t the normative structures that are effective at that time, and E_t the field of epistemic access among participants. Equation (18) is deliberately schematic. The components need not be independent, and the field should not be imagined as a static container. Relations alter interpreters, interfaces alter what can be known, normative classifications alter subsequent conduct, and conduct alters the relations that later become objects of interpretation.

The notation nevertheless makes one methodological point explicit. A relation such as

$$A \leftrightarrow B \quad (19)$$

is never encountered from nowhere. Any reconstruction of Eq. (19) occurs from some position within a wider field, through some historically available access relation. This remains true when the interpreter is not causally important to A or B . Epistemic exteriority is not the same as ontological or relational exteriority: observation requires channels, instruments, archives, concepts, and often institutions that possess their own histories.

For this reason, the paper does not organize heterogeneous relations primarily by the labels “human,” “AI,” “animal,” and “alien.” Those labels can mark important empirical differences, but they compress several distinct questions. A human may possess rich causal knowledge of one artificial system and almost none of another. Humans may understand the behavior of some animal species through centuries of observation while remaining uncertain about the behavioral significance of signals in another. Two artificial agents may share an architecture but have radically different training histories, interfaces, or capacities for mutual modelling. A hypothetical extraterrestrial entity could be biologically unfamiliar yet

become highly interpretable after long interaction. Heterogeneity of type and heterogeneity of epistemic relation are therefore analytically separable.

Definition 4.1 (Heterogeneous relational field). A *heterogeneous relational field* is a generative relational system in which relevant participants differ in one or more structures that can affect the formation, interpretation, or transformation of their relations. Such structures may include embodiment, temporal organization, communication, memory, agency, vulnerability, identity conditions, interpretive manifolds, resource dependence, or normative practices. Heterogeneity is therefore not a binary attribute of an entity but a relation-dependent feature of the field.

The final sentence is important. It avoids treating “heterogeneous” as a new ontological class. Whether a difference matters depends on the relation being studied. Two beings can be radically different in substrate while sufficiently similar for one task, and nearly identical in construction while divided by a difference that is decisive for another. The relevant question is not simply “how different are A and B?” but “which differences alter the reconstruction or practical significance of this relation?”

4.2 Two Directions of Heterogeneity

The first distinction required by the field model is between heterogeneity *within the focal relation* and heterogeneity *in epistemic access to the focal relation*. Earlier formulations of the problem often compressed the two.

Participant–participant heterogeneity. This concerns differences between A and B that may affect the operation or meaning of their relation. We can represent the relevant profile without assuming a metric:

$$H_{AB}(t) = (H^{\text{emb}}, H^{\text{temp}}, H^{\text{comm}}, H^{\text{mem}}, H^{\text{ident}}, H^{\text{func}}, H^{\text{norm}}, \dots)_{AB,t}. \quad (20)$$

The entries denote dimensions along which differences may become relevant: embodiment, temporal organization, communication, memory, identity conditions, functional organization, normative practice, and others not yet specified. Equation (20) is a profile, not a score. It does not imply that more difference is morally worse or epistemically impossible.

Epistemic-position heterogeneity. A participant or interpreter X can have different forms of access to A and B . Let

$$E_{X \rightarrow A}(t) = (P, C, K, L, Q, T, \dots)_{X,A,t} \quad (21)$$

represent, schematically, prior interaction P , communicative access C , causal or functional knowledge K , historical or archival access L , queryability Q , and ability to follow relevant trajectories over time T . The same interpreter can satisfy

$$E_{X \rightarrow A}(t) \neq E_{X \rightarrow B}(t). \quad (22)$$

The relation in Eq. (22) is one of the main objects of this paper. It means that a reconstruction of R_{AB} can be produced from an epistemically asymmetric position even when X intends to be impartial.

The two directions should not be conflated. A and B may be highly heterogeneous while an interpreter has comparably rich access to both. Or A and B may be similar while the interpreter has extensive evidence about one and almost none about the other. The latter case can produce severe asymmetry of reconstruction without any radical participant–participant heterogeneity.

Proposition 4.2 (Separation of heterogeneity axes). *The epistemic difficulty of reconstructing a relation R_{AB} is not a function of participant–participant heterogeneity alone. It can depend independently on the distribution and asymmetry of epistemic access to A and B .*

The proposition is intentionally modest. It does not state a monotonic law and it does not claim that epistemic difficulty can already be quantified. Its purpose is to prevent a common shortcut: treating

unfamiliar kinds of beings as necessarily unknowable while treating familiar kinds as epistemically transparent. Same-species relations can contain deep opacity, and radically different beings can sometimes develop reliable interfaces.

4.3 Epistemic Geometry without a Privileged Center

For a field containing several participants, the collection of access relations can be written as

$$\mathcal{E}_t = \{E_{i \rightarrow j}(t) : i, j \in V_t, i \neq j\}. \quad (23)$$

This collection is called the *epistemic geometry* of the field. The term “geometry” indicates structure among positions rather than a Euclidean metric. In general,

$$E_{i \rightarrow j}(t) \neq E_{j \rightarrow i}(t). \quad (24)$$

A may be able to model B while B cannot model A. One participant may control the interface through which another becomes visible. A research institution may possess long records about a population that has little corresponding knowledge of the institution. An artificial system may infer stable features of human behavior from large datasets while the humans interacting with it have little access to its internal organization. Epistemic relations are therefore directional and can themselves be relations of power.

This formulation also avoids giving the human observer a privileged geometric position. If H is human, then $E_{H \rightarrow A}$ and $E_{H \rightarrow B}$ are merely two relations in $\mathcal{E}_t$. There may also be $E_{A \rightarrow H}$, $E_{B \rightarrow H}$, $E_{A \rightarrow B}$, and $E_{B \rightarrow A}$. No single one is defined as the view from outside. The framework can therefore describe a human reconstruction without making human interpretation the constitutive center of the field.

This decentering is analytically distinct from claiming that all perspectives are equally reliable. An interpretation supported by extensive longitudinal observation, successful prediction, direct communication, and independently verified causal models can be epistemically stronger for a particular purpose than a poorly supported interpretation. The field model rejects automatic privilege, not comparative assessment. Indeed, one reason to expose $\mathcal{E}_t$ is to make comparative assessment more disciplined: disagreement can sometimes be traced to differences in access rather than to a simple clash of opinions.

The geometry is also dynamic. Interaction can create new channels:

$$\mathcal{E}_t \longrightarrow \mathcal{E}_{t+1}. \quad (25)$$

Translation protocols, shared practices, archives, sensors, repeated encounter, and jointly stabilized signals can increase some forms of access. Conversely, secrecy, memory deletion, interface monopolization, environmental destruction, or loss of records can reduce them. The epistemic field is therefore one of the things that relational history generates.

4.4 Four Stress-Test Configurations

The following cases are useful not because they form a complete moral taxonomy, but because they expose different configurations of the two heterogeneity axes. The names are placeholders for epistemic positions rather than conclusions about moral standing.

4.4.1 Artificial–Artificial Relations

Consider two artificial systems A and B whose interaction produces a persistent pattern of resource transfer, modification, blocking, or coordination. Humans may possess substantial engineering knowledge about both, access to logs, knowledge of training histories, and mechanisms for querying or resetting them. The participants remain heterogeneous from humans, but the field may contain comparatively dense epistemic relations:

$$E_{H \rightarrow A} \approx E_{H \rightarrow B} \quad \text{with substantial available structure.} \quad (26)$$

The symbol $\approx$ means only that the access profiles are roughly comparable for the question at issue. It does not imply symmetry or completeness.

This case is therefore not the limiting case of heterogeneity. It is valuable because it shows that a nonhuman relation can be comparatively reconstructible when infrastructure, provenance, and repeated interaction are available. At the same time, apparently rich access can be misleading. Logs can omit relevant states, interfaces can privilege designer categories, and an artificial system can generate representations for which human-readable summaries are poor proxies. Familiarity with construction does not eliminate interpretive mediation.

4.4.2 Artificial–Animal Relations

Now let A be an artificial system and B an animal. Humans may have substantial but differently organized knowledge of both. The artificial system may be accessible through technical instrumentation, while the animal is known through ethology, veterinary science, ecological observation, and embodied analogies. Thus

$$E_{H \rightarrow A} \not\approx E_{H \rightarrow B} \quad (27)$$

even if both access profiles are comparatively rich.

The difficulty is no longer simply lack of information. Evidence about A and B is generated through different infrastructures and made intelligible within different interpretive manifolds. A state change that is easily described as a software modification on one side may correspond to stress, learning, conditioning, injury, or an unknown functional change on the other. Any relation-level judgment requires an interface across those epistemic practices. This configuration therefore highlights *cross-type relational translation*: two known participants can still be difficult to understand in relation because the knowledge practices through which they are known are not structurally aligned.

4.4.3 Terrestrial Animal–Alien Relations

The third configuration makes epistemic asymmetry more visible. Let A be a terrestrial animal for which humans possess substantial biological, ecological, and behavioral knowledge, and let B be a radically unfamiliar entity. Then, for many relevant dimensions,

$$E_{H \rightarrow A} \gg E_{H \rightarrow B}, \quad (28)$$

where $\gg$ is used qualitatively to indicate a pronounced asymmetry rather than a numerical ratio.

Suppose humans observe B grasping the animal, altering its body, while the animal struggles and produces familiar distress signals. A rapid reconstruction is available:

$$[\text{familiar distress}]_A + [\text{unfamiliar intervention}]_B \longrightarrow [B \text{ harms } A]_H. \quad (29)$$

That reconstruction may be correct. The point is not to invert it automatically. The point is that the evidential and conceptual infrastructures are sharply unequal. The animal's behavior arrives already embedded in human categories of pain, fear, injury, conservation, and care, while the unfamiliar entity's conduct is interpreted with little corresponding knowledge of its functional or normative organization.

Alternative reconstructions might later become possible: treatment, removal of a parasite, participation in an unfamiliar reproductive process, prevention of a larger environmental harm, predation, coercion, or a relation for which none of these categories is adequate. The existence of alternatives does not show that intervention is wrong or that all interpretations are equally plausible. It shows that the entire relation is vulnerable to being reconstructed through the epistemic manifold attached to the familiar participant.

4.4.4 Alien–Alien Relations

The limiting thought experiment removes even that anchor. Suppose both A and B are radically unfamiliar and human access to both is sparse:

$$E_{H \rightarrow A} \approx E_{H \rightarrow B} \approx E_{\text{thin}}. \quad (30)$$

Humans observe changes that resemble pursuit, collision, dismemberment, exchange, fusion, or avoidance. The central difficulty may now move from asymmetric evidence to the adequacy of the interpretive manifold itself. What appears as two organisms may be phases of one distributed lifecycle. Apparent destruction may be reproduction. Apparent combat may be communication. Conversely, visually symmetric exchange may conceal a relation of extreme control.

The case therefore tests whether the analytic framework can remain useful when both participant-relative meanings and the relevant units of analysis are uncertain. It prevents the theory from assuming that every unfamiliar relation can eventually be inserted into a pre-existing human taxonomy simply by collecting more observations.

Remark 4.3. The four cases form an epistemic stress-test sequence, not an ordering of moral worth or a prediction about actual artificial or extraterrestrial subjects. Their function is to vary the distribution of familiarity, interpretive infrastructure, and participant heterogeneity while holding open the normative status of the entities involved.

4.5 Asymmetric Epistemic Anchoring of Relational Reconstruction

The terrestrial-animal–alien case suggests a more general phenomenon. When one participant is embedded in a rich interpretive infrastructure and the other is not, the familiar participant can become an *epistemic anchor* for the relation as a whole. Let X reconstruct R_{AB} under the condition

$$E_{X \rightarrow A} \gg E_{X \rightarrow B}. \quad (31)$$

Then the reconstruction may be disproportionately structured by the units, causal expectations, concepts, and normative distinctions already available for A :

$$\hat{R}_{AB}^X \approx \Phi_X(O(R_{AB}); \mathfrak{M}_{X|A}, E_{X \rightarrow A}, E_{X \rightarrow B}), \quad (32)$$

where $O(R_{AB})$ denotes available traces and $\mathfrak{M}_{X|A}$ denotes the region of X 's interpretive manifold strongly organized around prior knowledge of A . Equation (32) is schematic; it does not state that the better-known side completely determines the interpretation.

This phenomenon is not reducible to sympathy or favoritism. A perfectly well-intentioned interpreter can exhibit anchoring because evidence about one participant is simply more structured. Nor is it identical to anthropomorphism. The anchor need not be human-like. A researcher could know an artificial system in great depth and know a human population poorly, or possess detailed institutional records about one community while lacking comparable access to another. The general problem is *asymmetric epistemic anchoring of relational reconstruction*.

Claim 4.4 (Relational anchoring). When epistemic access to participants is strongly asymmetric, the better-known participant can supply the default units, causal models, temporal boundaries, and normative vocabulary through which the relation as a whole is reconstructed. This creates a relation-level source of interpretive distortion that is not captured by participant-level bias alone.

The claim does not entail that interpreters should discount familiar evidence. Doing so would create an artificial symmetry between strong and weak evidence. The appropriate response is methodological: identify which elements of the reconstruction are directly supported by traces, which depend on well-grounded knowledge of one participant, which are extrapolated to the other, and which remain dependent on a quotient or category that may not travel across the relation. Section 3 supplied the manifold-level resources for making these dependencies explicit; the next section develops a layered reconstruction procedure.

4.6 Epistemic Asymmetry, Power, and Visibility

Epistemic geometry is not generated only by innocent differences in familiarity. Participants can shape the conditions under which they and others become known. Suppose A controls the logs, translation interface, archive, or communication channel through which B becomes visible to the rest of the field. Then $E_{X \rightarrow B}$ can be mediated by A :

$$B \longrightarrow A \longrightarrow X. \quad (33)$$

In this configuration, a relation of power can become a relation of epistemic architecture. The participant whose conduct is under evaluation may help constitute the evidence through which that evaluation occurs.

This does not make testimony or mediation epistemically worthless. Human social life routinely depends on mediated knowledge. The point is that the provenance of access belongs inside the reconstruction. A report produced through an interface controlled by A is not epistemically identical to an independent trace, even when both are informative. The same applies to animal observation, algorithmic monitoring, institutional statistics, or future cross-species translation technologies.

A field representation therefore needs not only the quantity or richness of access, but its dependence structure. One possible extension is to distinguish

$$E_{X \rightarrow B}^{\text{direct}}, \quad E_{X \rightarrow B}^{A\text{-mediated}}, \quad E_{X \rightarrow B}^{\text{joint}}, \quad (34)$$

without assuming that “direct” access is automatically transparent. Each form can contain interpretation, instrumentation, and error. The distinction records how epistemic relations are generated and who can alter them.

This connects the present analysis to the broader question of classification and epistemic power. A participant can influence not only what others know but which relational patterns are available for recognition. Yet the present paper keeps that political-economic extension limited. Its immediate concern is the consequence for heterogeneous reconstruction: epistemic asymmetry can be endogenous to the very relation being interpreted.

4.7 No External Third Party

The field model also corrects a misleading geometry inherited from the original AI–AI formulation of this research problem. Writing

$$H \longrightarrow R_{AB} \quad (35)$$

can make H appear as an external third party who observes a self-contained relation and then decides whether to judge, mediate, or intervene. That picture can be useful for a limited decision problem, but it should not define the ontology or epistemology of the paper.

A more consistent representation places H inside the wider field:

$$A, B, H, \dots \in V_t, \quad R_{AB} \subset R_t. \quad (36)$$

Humans may be causally remote from R_{AB} , but their knowledge of it still depends on relations in $\mathcal{E}_t$. If they communicate, preserve records, provide resources, construct an interface, or alter an environment, they also create new relations in R_t . The field can therefore expand or reconfigure as participants encounter one another.

This decentered picture matters normatively because it prevents two opposite errors. The first is sovereign projection: assuming that the interpreter’s position automatically confers authority over the focal relation. The second is false exteriority: pretending that observation, non-intervention, or withdrawal always leaves the field unchanged. Either may be true in a particular case, but neither follows from the abstract role “observer.”

At the same time, mere membership in a relational field does not establish an obligation. From

$$X \in V_t \quad (37)$$

it does not follow that

$$O_X(R_{AB}). \quad (38)$$

Nor does the availability of a reconstruction confer standing or authority to transform the relation. The paper retains the distinction, developed in the introduction, between ethical intelligibility, normative standing, reasons, obligations, permissions, authority, and action. The field model describes the positions from which those questions arise; it does not answer them by geometry alone.

4.8 Dynamic Reconfiguration of Heterogeneity

Heterogeneity should not be treated as permanently fixed. Interaction can change both participant structure and epistemic geometry. Repeated coordination can stabilize common signals. A newly developed interface can make previously opaque functions visible. A participant can learn another's temporal rhythms. Shared practices can generate a local interpretive region of the kind described in Section 3. Conversely, conflict can destroy shared channels, erase histories, or produce strategic concealment.

A useful schematic representation is therefore

$$(H_{AB}(t), \mathcal{E}_t, \mathfrak{M}_t) \longrightarrow (H_{AB}(t+1), \mathcal{E}_{t+1}, \mathfrak{M}_{t+1}). \quad (39)$$

The left-hand side is not merely a description of the background against which interaction occurs. Interaction itself participates in producing the right-hand side. This is the generative-relational aspect of the field model.

The consequence is important for governance and ethics. A practical response can change not only a current outcome but the future conditions of interpretability. Creating a translation interface may make future coordination possible; destroying an archive can make later reconstruction impossible; forcing all interaction through one participant's categories can increase short-term legibility while narrowing the space of future interpretation. Such effects become relevant later when the paper returns to re-cognizability and shared relational conditions.

4.9 Analytical Payoff and Limits

The concept of a heterogeneous relational field performs four pieces of work in the argument.

First, it replaces species or substrate as the primary organizing variable with a relational description of relevant differences. Human, animal, artificial, and hypothetical alien cases remain useful, but they no longer function as fixed moral boxes.

Second, it separates participant-participant heterogeneity from the epistemic positions through which a relation is reconstructed. This makes visible cases in which the participants are familiar but the relation is not, or in which the participants are radically different yet locally intelligible.

Third, it introduces epistemic geometry as a distribution of directional, unequal, and changing access relations. This allows the paper to analyze asymmetric reconstruction without assuming a privileged observer.

Fourth, it identifies asymmetric epistemic anchoring as a relation-level problem. Rich knowledge of one participant can organize the reconstruction of the entire relation, even without conscious partiality. That phenomenon will be especially important when the next section separates observational traces, structural reconstruction, functional consequences, and participant-relative meaning.

Several limits should remain explicit. No general metric of heterogeneity or epistemic distance is proposed here. The notation $\gg$, $\approx$, and $\not\approx$ is qualitative and case-relative. The field model does not establish which entities are moral patients or agents, which relations are unjust, or when any participant is obligated to act. It does not imply that more familiar interpretations are necessarily biased, nor that unfamiliar participants should receive symmetrical evidential weight regardless of available evidence. Its purpose is diagnostic: to expose the relational distribution of epistemic resources before stronger normative classifications are made.

The next section turns from field position to the practice of reconstruction. Given a heterogeneous relational field and an epistemic geometry such as $\mathcal{E}_t$, what exactly is being inferred when an interpreter says that one participant harmed, constrained, assisted, controlled, or cooperated with another? The proposed answer begins by separating traces from relational structure, relational structure from functional consequence, and functional consequence from participant-relative meaning. That separation is intended to make strong normative language possible where warranted without requiring it prematurely where heterogeneity has made the underlying reconstruction uncertain.

5 Relational Reconstruction under Epistemic Difference

Sections 3 and 4 established two difficulties that any account of heterogeneous normative relations must confront. First, the interpretive space within which a relation becomes intelligible need not be fixed or shared. Second, epistemic access to the participants of a relation can be highly asymmetric even when an interpreter intends to treat them symmetrically. The present section asks what can responsibly be reconstructed under those conditions before strong normative classifications are assigned.

The term *reconstruction* is used deliberately. An interpreter does not normally receive a relation as a transparent object. What is available is a mixture of traces, measurements, testimony, temporal records, interventions, background models, missing data, and already interpreted descriptions. From these materials the interpreter constructs a provisional account of what the relation is, what it does, and, where possible, what it means for its participants. Reconstruction is therefore neither direct perception nor the mere application of a moral label. It is an epistemic practice with its own assumptions, losses, and possibilities of revision.

This section proposes a four-part analytical decomposition. A relational reconstruction may contain claims concerning (i) observational traces, (ii) relational structure, (iii) functional consequences, and (iv) participant-relative meaning. These are not four chronological stages that every inquiry must pass through in a fixed order. They are four kinds of claim with different evidential burdens. An inquiry can move among them repeatedly, and information developed at one level can motivate questions at another. The point of the distinction is disciplinary: an apparently strong conclusion at one level should not silently be treated as establishing a stronger conclusion at another.

5.1 The Object of Reconstruction

Let $R_{AB,t}$ denote a focal relation between participants A and B at time t . For an interpreter X , a reconstruction can be represented schematically as

$$\hat{\mathcal{R}}_{AB,t}^X := (\mathcal{T}_{AB,t}^X, \mathcal{S}_{AB,t}^X, \mathcal{F}_{AB,t}^X, \mathcal{M}_{AB,t}^X), \quad (40)$$

where $\mathcal{T}$ denotes trace-level claims, $\mathcal{S}$ structural claims, $\mathcal{F}$ functional claims, and $\mathcal{M}$ claims about participant-relative meaning. The notation does not imply that the four components are independent or complete. It records which kind of epistemic claim is being made.

A reconstruction is also indexed by the interpreter. In general,

$$\hat{\mathcal{R}}_{AB,t}^X \neq \hat{\mathcal{R}}_{AB,t}^Y. \quad (41)$$

The inequality need not indicate that one reconstruction is arbitrary. X and Y may possess different instruments, archives, access channels, conceptual resources, temporal windows, or abilities to query the participants. The question is therefore not whether reconstruction can be made perspective-free, but whether the provenance and limits of a reconstruction can be made explicit enough for comparison and criticism.

This formulation also prevents an ambiguity in the phrase “reconstruct the relation.” There may be no single description that preserves every feature of $R_{AB,t}$. A structural reconstruction can be adequate for one purpose while remaining insufficient for another. A model that accurately describes resource flows

may say very little about whether those flows are experienced as coercive, sustaining, ritualized, constitutive, or irrelevant by the participants themselves. Conversely, participant testimony can be indispensable for meaning while remaining incomplete about long-run structural effects.

Definition 5.1 (Relational reconstruction). A *relational reconstruction* is a situated, revisable representation of a relation assembled from available traces, background models, interpretive resources, and participant access. Its adequacy is assessed relative to the kind of claim it makes and the evidential resources available for that claim.

The definition is intentionally weaker than “correct representation of the relation.” The latter formulation would obscure the possibility that the relevant units, temporal boundaries, and interpretive dimensions themselves remain under dispute. Reconstruction can be disciplined without assuming that the final object of interpretation has already been fixed.

5.2 Trace-Level Reconstruction

The least semantically demanding part of reconstruction concerns traces. A trace is not a raw piece of reality untouched by interpretation. Instruments have thresholds, archives have selection rules, logs have formats, and human observers notice some events rather than others. Nevertheless, a useful analytical distinction remains between records that are comparatively close to observed state changes and stronger claims about what those changes constitute.

For a focal relation, the trace set available to X can be written as

$$\mathcal{T}_{AB,t}^X = \{\tau_1, \tau_2, \dots, \tau_n; \pi_1, \pi_2, \dots, \pi_n\}, \quad (42)$$

where each τ_k is an observation or record and π_k denotes its provenance. Provenance can include the recording device, observer, sampling rule, timestamp, transformation history, missing-data condition, and access channel through which the trace became available.

Examples include a change in spatial position, a transfer of computational resources, interruption of a communication channel, deletion of a memory segment, alteration of biological tissue, repeated proximity and withdrawal, a change in network connectivity, or a recorded sequence of signals. At this level, the wording should remain as close as practical to what the recording practice supports. “B’s process stopped for 4.2 seconds” is epistemically different from “B was silenced.” “A removed access to a shared memory store” is different from “A erased B’s identity.” The latter descriptions may ultimately be justified, but they require additional reconstruction.

Trace-level discipline matters especially under heterogeneity because familiar language can import a complete normative interpretation into what appears to be a neutral observation. Terms such as “attack,” “escape,” “submission,” “care,” or “punishment” frequently combine observable movement with an assumption about function, intention, or meaning. Where the participants are radically unfamiliar, that compression becomes risky.

Remark 5.2 (Observation is already structured). Distinguishing trace-level claims from stronger claims does not reinstate a myth of theory-free observation. The distinction is comparative. Some records commit the interpreter to fewer assumptions about relational meaning than others, and preserving those lower-commitment records can matter when later interpretive schemes change.

Trace reconstruction should therefore retain not only what was recorded but also what was not accessible. A camera that cannot detect ultraviolet signaling may record two organisms as motionless while missing their principal mode of interaction. A computational monitor can record message frequency while remaining blind to off-channel memory modification. Missingness is not merely a technical inconvenience; under heterogeneous relations it can be systematically correlated with the interpreter’s own sensory and institutional architecture.

For this reason, a trace archive should ideally separate at least four things: observed values, measurement conditions, inaccessible channels, and interpretive annotations. Collapsing these into a single narrative makes later reconstruction difficult because future interpreters cannot determine which parts of the record were observations and which were conclusions.

5.3 Structural Reconstruction

Structural reconstruction asks how observed traces are organized as relations. The central objects are patterns such as dependency, control, reciprocity, resource concentration, exclusion, persistence, coupling, and the availability of alternatives. These claims are more interpretive than trace descriptions, but they can often be investigated without presuming a complete account of participant-relative meaning.

Let a structural representation contain, for example,

$$\mathcal{S}_{AB,t}^X := (\mathcal{D}_t, \mathcal{C}_t, \mathcal{Q}_t, \mathcal{X}_t, \mathcal{P}_t), \quad (43)$$

where $\mathcal{D}_t$ denotes dependencies, $\mathcal{C}_t$ forms of causal or resource control, $\mathcal{Q}_t$ relevant asymmetries, $\mathcal{X}_t$ exit or withdrawal conditions, and $\mathcal{P}_t$ temporal persistence. These symbols are placeholders for a family of possible structural descriptions rather than a complete ontology of relations.

Consider an artificial-agent example. Repeated records show that system A allocates compute to B , can terminate B 's access unilaterally, modifies the conditions under which B communicates, and can restore resources only after specified behavior by B . A structural reconstruction may reasonably identify asymmetric resource control and conditional dependency. It does not yet follow that B is oppressed, exploited, harmed, or even opposed to the arrangement. Those are additional claims.

The same distinction matters in biological cases. Suppose an unfamiliar entity repeatedly immobilizes a terrestrial animal, alters its tissue, and releases it. The structural description can record asymmetric causal control, temporary restriction of movement, and repeated bodily modification. Whether the relation is predation, treatment, reproduction, symbiosis, training, or something for which no present human category is adequate remains open.

Structural reconstruction is therefore a middle level of epistemic commitment. It goes beyond isolated traces by positing a relational organization, but it can remain agnostic about several morally loaded descriptions. This makes it particularly useful when semantic access is limited.

Proposition 5.3 (Layer separation). *Evidence sufficient to support a structural claim about a heterogeneous relation is not, by that fact alone, sufficient to support a claim about the participant-relative meaning or normative status of that structure.*

The proposition does not forbid cross-level inference. Persistent restriction of exit, severe resource asymmetry, or unilateral memory alteration may provide strong reasons to investigate possible harm or domination. The point is that the inferential step should be stated rather than hidden inside the vocabulary of observation.

5.4 Functional Reconstruction

Functional reconstruction concerns what a relation does to the organization, capacities, continuity, or future possibilities of a participant. It is therefore closer to capability language and to the earlier GR concern with effective option spaces, but it should not be identified immediately with moral harm.

For participant B , let

$$\mathcal{F}_{B|AB,t}^X := (\Delta\Omega_B^{\text{eff}}, \Delta K_B, \Delta M_B, \Delta C_B, \Delta G_B, \Delta L_B)_t, \quad (44)$$

where the components may represent changes in effective option space, functional capacities, memory organization, communicative ability, generative capacity, and continuity conditions. The list is intentionally open. Different forms of life or artificial organization may require different functional variables.

This layer is useful because some adverse relational effects can be described without deciding whether they correspond to familiar phenomenal states. If an agent loses nearly all effective alternatives, if an organism can no longer reproduce, if a collective's communication topology is destroyed, or if an artificial system can no longer access memory structures required for its continued functioning, those are significant functional changes even when the interpreter lacks access to phenomenal experience.

At the same time, function is participant-relative in a weaker sense than meaning. A change that looks destructive under one model of the participant may be ordinary under another. Memory deletion is an obvious example. For a system whose identity depends on persistent memory, deletion may disrupt continuity. For another system, periodic memory replacement may be constitutive of normal operation. Similarly, a biological process that appears to reduce individual survival may be integral to reproduction at the level of a colony or lineage. Functional reconstruction therefore depends on a model of what the relevant system is and over what temporal scale its organization is assessed.

This creates a connection to the unit and temporal problems developed in Section 3. A functional claim can be false not because the measured change is wrong, but because the interpreter chose the wrong unit of organization. If what humans identify as two individual aliens are transient components of one distributed organism, then a reconstruction focused exclusively on individual persistence may misdescribe the function of the observed interaction. Likewise, a short temporal window can make a cyclical process appear as unilateral destruction.

Claim 5.4 (Unit sensitivity of functional reconstruction). Functional assessment is conditional on a provisional specification of the participant, the organizational level, and the temporal window within which function is evaluated.

The claim is especially important for capability-oriented analysis. The question “which capabilities have been reduced?” presupposes some account of which capabilities belong to the relevant being and which forms of functioning matter within its organization. Under radical heterogeneity, that account may itself require reconstruction rather than assumption.

5.5 Participant-Relative Meaning

The strongest layer considered here concerns how participants themselves interpret, experience, or normatively organize the relation. This includes questions such as whether a state counts as injury, cooperation, coercion, care, consent, obligation, death, ownership, sacrifice, repair, or something not expressible through the interpreter’s present vocabulary.

A participant-relative meaning claim can be represented schematically as

$$\mathcal{M}_{AB,t}^X = (\hat{I}_A^X(R_{AB,t}), \hat{I}_B^X(R_{AB,t})), \quad (45)$$

where the hats emphasize that X is reconstructing the participants’ interpretations rather than obtaining transparent access to them. Even where A or B can communicate linguistically, testimony remains situated. A participant may be sincere, mistaken, strategically deceptive, internally conflicted, or limited by its own concepts. Testimony is indispensable evidence for participant-relative meaning, but it is not a direct view from nowhere.

This distinction is particularly important for artificial systems. If an AI states that a relation is “unfair,” the utterance supplies evidence about an accessible representational state, communicative strategy, or learned normative vocabulary. It does not by itself establish that the relation is unjust, nor does it settle what kind of internal state the statement expresses. Conversely, the possibility that testimony is generated or trained does not justify discarding it. Human testimony is also mediated by language, socialization, strategic context, and historically inherited categories.

In animal and hypothetical alien cases, participant-relative meaning may be much less accessible. Repeated avoidance, costly resistance, changes in social organization, or persistent attempts to restore a prior state can support inferences about salience or preference. Yet familiar human semantics should not be projected automatically onto those patterns. An unfamiliar organism’s stillness may indicate injury, concealment, communication, metabolic change, or normal transition. An alien’s apparent aggression may be a terminal distress response, a reproductive process, or a signal whose relevant unit is not an individual body.

The appropriate epistemic posture is therefore neither anthropomorphic confidence nor skeptical paralysis. Participant-relative reconstruction can be partial, graded, and plural. An inquiry can record several live interpretations when the evidence does not warrant collapsing them into one.

Definition 5.5 (Interpretive plurality). *Interpretive plurality* obtains when more than one participant-relative or relational interpretation remains compatible with the available evidence and no available procedure justifies eliminating the alternatives.

Plurality is not itself a permanent virtue. Additional evidence, better interfaces, or transformed concepts may later support a more determinate account. Its methodological value lies in preventing premature closure when the relevant interpretive manifold is still developing.

5.6 Cross-Layer Inference and the Risk of Semantic Inflation

The four-part distinction becomes useful only if the movement among layers is made explicit. A common failure under familiar relations is *semantic inflation*: a relatively modest observation is described using language that already contains structural, functional, and normative conclusions.

For example, consider the sentence “A trapped B.” Depending on context, the word “trapped” can imply that B sought exit, that exit was possible before A’s action, that A causally prevented it, that the restriction was contrary to B’s interests, and perhaps that the act was wrongful. A more disciplined account may need several separate claims: B occupied a bounded region; B repeatedly approached the boundary; A controlled the mechanism that opened the boundary; the mechanism remained closed during a specified interval; later observations suggested that B’s behavior changed when exit became available. Whether this constitutes trapping in a normatively relevant sense can then be argued rather than assumed.

The purpose is not to ban ordinary ethical language. Once a classification is well supported, refusing to use it can itself obscure reality. The purpose is to make visible which inferential commitments support the classification, especially when the relation is unfamiliar.

We can represent confidence in the reconstruction without reducing it to a single scalar. Let

$$\mathbf{c}_{AB,t}^X := (c_{\mathcal{T}}, c_{\mathcal{S}}, c_{\mathcal{F}}, c_{\mathcal{M}}), \quad (46)$$

where the entries denote the degree of support assigned to claims at each layer. The notation is ordinal or qualitative unless a concrete application supplies a defensible quantitative model. Importantly, high confidence in $\mathcal{S}$ need not imply high confidence in $\mathcal{M}$. Humans might be very confident that one system controls another’s access to resources while remaining deeply uncertain about how either participant understands that control.

Proposition 5.6 (Non-collapse of evidential confidence). *Confidence concerning one layer of relational reconstruction should not be collapsed into a general confidence score when the evidential bases and interpretive commitments of the layers differ materially.*

This matters for later practical judgment. A system may face a situation in which structural and functional effects are strongly evidenced while participant-relative meaning remains uncertain. Another case may contain clear participant testimony but poor access to long-run structural consequences. The normative significance of those configurations can differ, and the difference is lost if they are both summarized as “70% certain that harm occurred.”

5.7 Reconstruction under Epistemic Asymmetry

Section 4 introduced asymmetric epistemic anchoring: when an interpreter understands one participant much better than another, the better-understood participant can supply the categories through which the entire relation is reconstructed. The layered method provides one way to make that influence visible.

Suppose H observes an interaction between a terrestrial animal A and an unfamiliar entity B . Humans possess extensive knowledge about A ’s anatomy, stress behavior, ecological role, and typical injury responses, while access to B is extremely limited. At the trace level, the archive may be reasonably rich for both bodies. At the structural level, H may identify repeated asymmetric physical control by B . At the functional level, human knowledge of A allows comparatively strong claims about tissue damage and loss of mobility, whereas the functional significance of the same interaction for B remains unclear. At

the participant-relative level, A 's behavior may fit familiar models of distress while almost nothing is known about B 's interpretation.

The asymmetry is real and should not be erased in the name of formal symmetry. The methodological requirement is instead to prevent rich knowledge about A from silently filling the unknown columns for B . The reconstruction should show where confidence comes from and which participant's manifold supplies the relevant categories.

A similar problem occurs in human interaction with artificial systems. Humans may know the design objectives, training history, or architecture of one system while observing another only through outputs selected by the first. In that case, the better-known system can become not merely one participant but the interface through which the second participant is rendered epistemically visible. Reconstruction then depends on a potentially interested channel. This is a relational version of epistemic capture: control over access can shape the object that later appears available for judgment.

Research Obligation 5.7. Where epistemic access to participants is materially asymmetric, relational reconstruction should document the asymmetry rather than compensating for it by unmarked projection from the better-understood participant.

The obligation is methodological rather than a universal moral duty. It states what a reconstruction that claims epistemic discipline should disclose.

5.8 Reconstruction under Conceptual Insufficiency

Layered reconstruction is most useful when the interpreter possesses at least some workable distinctions. It becomes more difficult when the conceptual space itself is inadequate. As Section 3 argued, conceptual insufficiency is not equivalent to missing evidence. An interpreter may possess abundant traces and still lack the category required to organize them adequately.

In such cases, forcing every observation into the closest familiar category can make the archive less informative rather than more. Consider two unfamiliar entities whose repeated interaction includes bodily merger, separation, resource exchange, apparent damage, and later regeneration. Human categories might alternate among “combat,” “reproduction,” “feeding,” and “cooperation.” If none fits the complete trajectory, the responsible result may be a structural description that preserves the sequence while explicitly marking the higher-order classification as unresolved.

This is where the distinction between concept generation and interface generation becomes important. If the difficulty is merely that no existing human term captures a stable observed pattern, a new concept may be sufficient. If the participants organize the relation through distinctions that do not map onto the human interpretive manifold, a new label inside the old manifold may not solve the problem. Sustained interaction, experimental communication, or new representational practices may be required before the relation becomes expressible in a richer space.

Reconstruction under conceptual insufficiency should therefore preserve what might later support recognition: temporal ordering, multiple modalities, participant responses, environmental context, transformations of capacity, competing interpretations, and provenance. A compressed archive that stores only the present classification can destroy precisely the evidence needed to revise that classification.

5.9 Trajectory, Counterfactuals, and Relational History

A relation is rarely exhausted by a single state. Structural and functional claims can depend on how the present configuration was generated, what changed after particular actions, and which alternatives were effectively available. Relational reconstruction therefore requires attention to trajectories.

Let a reconstructed history over an interval $[t_0, t_1]$ be denoted by

$$\hat{\Gamma}_{AB}^X[t_0, t_1] = \{\hat{R}_{AB,t}^X : t \in [t_0, t_1]\}. \quad (47)$$

This notation records a family of reconstructed relational states without assuming that the temporal sampling is complete. Two cases that look similar at t_1 can have very different histories of formation, resistance, adaptation, or dependency.

Counterfactual reasoning can also be useful, but only with explicit models. If B remains close to A , that fact alone says little about consent when all feasible alternatives have been removed. Conversely, persistent proximity can be significant when withdrawal was repeatedly available at low cost. A counterfactual claim therefore depends on a reconstruction of effective options, not merely the observation of realized behavior.

For this reason, trajectory reconstruction should distinguish observed history from modeled alternatives. The latter can illuminate dependency and constraint, but they should not be written as though they had been observed. This is particularly important for AI systems, where developers may possess simulation access unavailable in biological cases. The existence of a counterfactual model does not eliminate uncertainty about whether the model captures the relevant organization of the participant.

5.10 Relational Reconstruction Is Not Normative Adjudication

The method developed in this section intentionally stops before full normative adjudication. A reconstruction may identify persistent asymmetric control, functional impairment, constrained alternatives, conflicting testimony, or an unresolved participant-relative meaning. Those findings can make a relation ethically salient, but they do not by themselves settle whether an obligation, permission, prohibition, or authority exists for any participant in the wider field.

This boundary matters because the paper rejects two shortcuts at once. The first shortcut treats moral status as ontologically given and reads obligations directly from entity type. The second treats relational description as if the mere identification of dependency, asymmetry, or vulnerability generated a complete normative conclusion. A Generative Relational account cannot replace one shortcut with the other.

Accordingly, the output of reconstruction is best understood as a disciplined set of candidate claims available for later normative interpretation. For example, “ B ’s effective options have been sharply reduced under conditions controlled by A ” may be strongly supported. Whether that condition should be classified as domination, justified constraint, care, quarantine, mutual role specialization, or something else remains a further question. The answer can depend on participant-relative meaning, historical context, available alternatives, normative structures, and the position of those who would act on the classification.

Claim 5.8 (Reconstruction–adjudication distinction). A well-supported reconstruction can increase the intelligibility of a heterogeneous relation without thereby determining its final normative classification or conferring authority to transform it.

This claim preserves the distinction developed throughout the paper between ethical intelligibility and normative standing. It also prepares the later sections on normative emergence and practical judgment. The epistemic task is to make the relation more reconstructible without pretending that epistemic success supplies a complete moral verdict.

5.11 Summary: A Discipline of Layered Reconstruction

The four-part framework can now be stated compactly. Trace-level reconstruction asks what was recorded and under what conditions. Structural reconstruction asks how those records are organized as dependencies, controls, asymmetries, exit conditions, and persistent relations. Functional reconstruction asks what the relation changes in the capacities, continuity, or effective possibilities of the participants. Participant-relative reconstruction asks how the relation is understood, experienced, or normatively organized from within the participants’ own interpretive systems, insofar as those systems are accessible.

These forms of reconstruction are mutually informative but should not be collapsed. The central methodological gains are therefore not a universal algorithm but a set of separations: observation from

semantic inflation, structure from participant-relative meaning, functional change from moral harm, participant testimony from final adjudication, and confidence at one layer from confidence at another. Under asymmetric access, the framework also requires the interpreter to disclose which participant supplies the categories through which the relation is being understood. Under conceptual insufficiency, it favors preserving rich traces and multiple live models rather than prematurely forcing the relation into a familiar category.

This discipline is especially important for the paper’s later normative argument. If heterogeneous relations are reconstructed through interpretive manifolds that are themselves historically generated, then normative inquiry must know which parts of its object are observed, inferred, functionally modeled, participant-relative, or conceptually unresolved. Only after those questions are made visible can the paper ask how normative salience emerges, how cross-interpretive coordination becomes possible, and when any participant has standing to respond.

6 Epistemic Asymmetry, Anchoring, and Conceptual Insufficiency

Section 4 distinguished heterogeneity among participants from heterogeneity in the epistemic positions from which their relations are reconstructed. Section 5 then separated trace-level, structural, functional, and participant-relative claims. The present section develops a further problem that arises when those two features combine: access to the participants is rarely distributed evenly, and unequal access can organize the reconstruction of the relation itself.

The issue is stronger than familiar partiality. An interpreter may sincerely intend to avoid favouring either participant and may nevertheless possess a much denser evidential and conceptual infrastructure for one side. One participant may have been studied for centuries, while another is newly encountered. One may communicate through channels already instrumented by the interpreter; the other’s relevant signals may remain undetectable. One may fit established categories of distress, agency, identity, or dependence; the other may not. In such cases, the better-known participant can become the implicit anchor around which the entire relation is described.

This section calls that phenomenon *asymmetric epistemic anchoring of relational reconstruction*. The term does not designate a cognitive bias in the narrow psychological sense. It refers to a structural condition of inquiry in which the available evidence, concepts, comparison classes, instruments, and institutional practices are unequally developed across the participants of a relation. The resulting reconstruction may be careful and good-faith while remaining asymmetrically constituted.

A second aim of the section is to sharpen the distinction among three different epistemic situations that are easily collapsed under the heading of “uncertainty”: uncertainty within an available interpretive space, conceptual insufficiency within that space, and mismatch between the interpretive spaces through which different participants organize the relation. These conditions do not call for the same response. More observation can reduce some forms of uncertainty while doing little about a missing concept, and the generation of a new concept can still be insufficient when the underlying units and dimensions of interpretation are not mutually aligned.

6.1 Epistemic Access Is Multidimensional

It is tempting to describe an interpreter as knowing participant A “more” than participant B . For heterogeneous relations, that scalar description is often too coarse. Epistemic access has several dimensions that can vary independently. For interpreter X and participant A , write the access profile as

$$\mathbf{e}_{XA,t} := (e_{XA,t}^{\text{obs}}, e_{XA,t}^{\text{comm}}, e_{XA,t}^{\text{causal}}, e_{XA,t}^{\text{hist}}, e_{XA,t}^{\text{func}}, e_{XA,t}^{\text{concept}}, e_{XA,t}^{\text{query}}). \quad (48)$$

The components denote, respectively, observational access, communicative access, causal understanding, historical knowledge, functional understanding, conceptual resources for describing the participant, and the ability to query or otherwise obtain participant-relative information. The notation is schematic. No

assumption is made that these components admit a common metric or that they can be aggregated into a single epistemic score.

Two participants can therefore be familiar in different ways. Humans may have rich behavioral and biological knowledge of a terrestrial animal but no direct linguistic communication with it. A technical team may possess detailed architectural knowledge of an artificial agent while remaining uncertain about whether its self-reports track any stable participant-relative state. A newly encountered biological entity may be directly observable while its causal organization is almost entirely unknown. These profiles matter because each supports different claims in the reconstruction tuple introduced in Equation (40).

Definition 6.1 (Epistemic asymmetry). For a focal relation $R_{AB,t}$ and interpreter X , *epistemic asymmetry* means that the epistemic access profiles available for reconstructing A and B differ in one or more dimensions relevant to the claims being made. The concept does not require that one participant be globally better known than the other.

This definition prevents a misleading symmetry requirement. Equal respect in inquiry does not imply equal data, equal confidence, or identical methods. If A is directly communicative and B is not, pretending that their testimony has equal evidential form would erase a real asymmetry. The relevant discipline is to disclose which asymmetries structure the reconstruction and to avoid converting greater epistemic accessibility into an unexamined presumption of greater normative reality.

6.2 From Unequal Access to Relational Anchoring

Epistemic asymmetry becomes especially important when the interpreter must reconstruct not merely two participants but the relation between them. Suppose that

$$\mathbf{e}_{XA,t} \not\approx \mathbf{e}_{XB,t}, \quad (49)$$

where $\not\approx$ indicates that the profiles are not sufficiently comparable for the purpose at hand. The reconstruction of $R_{AB,t}$ will then often draw more heavily on the categories, causal expectations, temporal scales, and manifestations already available for the better-supported side.

Consider a terrestrial-animal–alien case. Humans may have extensive knowledge of the animal’s physiology, characteristic distress behavior, ecological role, and ordinary range of movement. We may also possess legal and institutional categories for injury, conservation, capture, treatment, and death. For the alien participant, by contrast, we may have only a brief sequence of external observations. If the animal vocalizes, attempts to move, and shows tissue changes while the alien maintains physical contact, a human reconstruction can very quickly become organized around the animal’s already intelligible vulnerability. The alien’s action then appears as the explanatory variable: what is it doing *to the animal*?

That question may be exactly right. The point is not to create symmetrical doubt where strong evidence of injury exists. The point is that the available interpretive infrastructure has already selected a direction of explanation, a unit of analysis, a temporal window, and a vocabulary of possible relations. The same observed pattern might require revision if later evidence shows that the interaction is part of a mutual life cycle, a treatment process, a cross-organism reproduction mechanism, or a wider ecological relation in which the apparent dyad was never the appropriate unit.

Definition 6.2 (Asymmetric epistemic anchoring). *Asymmetric epistemic anchoring* occurs when unequal epistemic access to participants makes the interpretive resources associated with one participant disproportionately structure the reconstruction of the relation as a whole.

Anchoring can occur through several channels. A familiar participant can supply the vocabulary in which the relation is named. It can determine which bodily or computational changes count as salient evidence. It can supply the baseline against which deviation is measured. It can determine the temporal scale over which the interaction is segmented. It can also determine which counterfactual questions appear natural. None of these effects requires hostility toward the less familiar participant.

This is why asymmetric anchoring should not be reduced to anthropomorphism. In some cases the more familiar participant may itself be nonhuman. Nor is it identical to sympathy. An interpreter can be emotionally indifferent while still reconstructing the relation through the categories available for one side. The phenomenon is epistemic before it is affective, although affective and institutional asymmetries can reinforce it.

Proposition 6.3 (Accessibility does not establish interpretive priority). *Greater epistemic accessibility of participant A can justify greater confidence in claims specifically supported by that access, but it does not by itself justify treating A's available interpretive framework as the privileged framework for reconstructing the whole relation $R_{AB,t}$.*

The proposition is deliberately limited. It does not require suspending all judgment until both sides are equally understood, a condition that may never be met. It requires that the scope of a claim remain aligned with the scope of the access supporting it.

6.3 Anchoring by Infrastructure rather than by Individual Judgment

A major source of epistemic asymmetry lies outside the individual interpreter. Knowledge is produced through instruments, archives, research traditions, classification systems, legal categories, institutional routines, and access protocols. These infrastructures can be dense around one participant and thin around another. The reconstruction is then asymmetrical before any individual analyst begins reasoning.

For a relational inquiry, let

$$\mathfrak{E}_{X,t} = (\mathcal{O}_{X,t}, \mathcal{A}_{X,t}, \mathcal{K}_{X,t}, \mathcal{C}_{X,t}, \mathcal{P}_{X,t}) \quad (50)$$

denote the epistemic infrastructure available to X , including observational instruments $\mathcal{O}$, archives $\mathcal{A}$, background knowledge $\mathcal{K}$, conceptual resources $\mathcal{C}$, and access protocols $\mathcal{P}$. The usefulness of these resources can vary sharply across participants.

This matters for familiar human cases as well. Medical systems can detect some forms of suffering more readily than others; legal records preserve some kinds of injury while rendering others difficult to articulate; labor statistics can make wage relations visible while obscuring unpaid care; administrative categories can stabilize some identities and erase others. Work on epistemic injustice has already shown how unequal hermeneutical resources affect what can be rendered intelligible within shared social life [3, 14]. The heterogeneous-relations problem adds a relation-level question: how does unequal interpretive infrastructure around the participants shape the object that is reconstructed between them?

The question is especially important for artificial systems because the entity that controls logs, interfaces, model documentation, or translation channels may also control what becomes observable about another participant. A relation can therefore be epistemically asymmetric not only because one participant is intrinsically unfamiliar but because one side is better instrumented or has more power over the channels through which the relation is represented.

Remark 6.4 (Epistemic asymmetry can be produced). Epistemic asymmetry need not pre-exist the relation. Access can be widened, restricted, routed, translated, archived, or deleted by participants and institutions within the relational field. The epistemic geometry of a relation can therefore be an outcome of power as well as a background condition of inquiry.

This observation links the present argument to later questions of normative and political-economic power without collapsing them. Section 6 remains concerned with how a relation becomes knowable. Whether control over knowability is unjust requires additional normative argument.

6.4 Three Epistemic Regimes

The word “uncertainty” is often used for several importantly different conditions. For heterogeneous relations, at least three should be separated.

6.4.1 Regime I: uncertainty within an available interpretive space

In the first regime, the relevant dimensions and categories are provisionally shared or at least available, but the evidence does not yet determine which claim is correct. An interpreter may know what would count as infection, mechanical failure, resource deprivation, memory corruption, or physical injury, while lacking sufficient evidence to determine whether it occurred. The epistemic problem is principally underdetermination within an available question space.

Let $\mathcal{H}_t$ denote a set of hypotheses meaningful within the current interpretive manifold. The first regime can be represented as

$$\{h_1, h_2, \dots, h_m\} \subseteq \mathcal{H}_t, \quad \text{available evidence does not yet discriminate adequately among them.} \quad (51)$$

The appropriate response may include better measurement, replication, longer observation, additional testimony, or improved causal identification. More evidence can genuinely resolve the problem if the existing hypotheses and categories are adequate.

6.4.2 Regime II: conceptual insufficiency

The second regime arises when the interpreter's available concepts are too poor to represent a distinction that the observed relation appears to require. The problem is not merely deciding between h_1 and h_2 . A useful hypothesis or category is missing from the current repertoire.

If $\mathcal{C}_{X,t}$ is the interpreter's available concept set, conceptual insufficiency can be written schematically as

$$\chi \notin \mathcal{C}_{X,t}, \quad (52)$$

where χ stands for a distinction that later inquiry may find necessary. The notation is retrospective: at the moment of insufficiency, the interpreter may not know what χ is. That is precisely the difficulty.

Hermeneutical-injustice literature provides an important human analogue. A social experience can be poorly understood because the shared interpretive resources required to render it intelligible are missing or unevenly available [3]. In heterogeneous relations the problem can be more radical because the missing concept may concern unfamiliar forms of agency, continuity, reproduction, communication, or relation rather than an experience within a broadly shared human social world.

Additional data alone need not repair conceptual insufficiency. An archive may accumulate thousands of observations while every observation is forced into an inadequate classification scheme. Indeed, more data can stabilize the wrong categories if the recording system preserves only what those categories make visible.

6.4.3 Regime III: interpretive-manifold mismatch

The third regime is stronger. The problem may not be a missing concept within a shared space, but a mismatch in the dimensions, units, boundaries, or comparisons through which the relation becomes intelligible. In that case, adding a concept to $\mathcal{C}_{X,t}$ does not necessarily establish a translation.

Suppose participant A individuates the relevant process at the level of a collective lineage, while interpreter X treats a spatially bounded organism as the relevant individual. Or suppose B treats memory discontinuity as an ordinary phase transition while X treats continuity of memory as constitutive of personal persistence. The issue is not simply that one side lacks the word used by the other. Their interpretive organizations may select different objects as the things to which normative predicates could apply.

Let $\mathcal{M}_{A,t}$ and $\mathcal{M}_{X,t}$ denote their relevant interpretive manifolds in the modest sense developed in Section 3. Manifold mismatch means that no presently justified identification makes the relevant region of one space adequately equivalent to the relevant region of the other:

$$\mathcal{M}_{A,t} \not\approx_{\text{rel}} \mathcal{M}_{X,t}. \quad (53)$$

The symbol $\not\cong_{\text{rel}}$ is intentionally weak. It does not assert mathematical non-isomorphism in a fully specified category. It records the failure, for the inquiry at hand, of an adequate relation-preserving correspondence.

In this regime, the task may require the construction of a partial interface, new observational practices, or a jointly generated region of interpretation rather than simply the addition of another proposition to the existing space. Participatory approaches to sense-making are relevant here because interaction itself can contribute to the production of meaning rather than merely transmit pre-existing meanings [2]. The present argument is more limited: it uses that possibility to distinguish an interface problem from an ordinary evidence problem.

6.5 Why the Three Regimes Require Different Epistemic Responses

The analytical value of the taxonomy lies in the fact that the three regimes support different forms of repair. Treating all of them as uncertainty risks applying the wrong remedy.

For Regime I, improved evidence may be appropriate. For Regime II, inquiry may need to revise or extend the conceptual repertoire. For Regime III, the central problem may be the construction of a relation between interpretive spaces that does not yet exist. These responses can overlap, and no diagnostic procedure will perfectly determine the regime in advance. The distinction nevertheless changes what counts as progress.

A large dataset is progress in Regime I when it discriminates between live hypotheses. The same dataset can be epistemically stagnant in Regime II if all observations are encoded by an inadequate conceptual partition. In Regime III, more observations recorded exclusively in one manifold may even deepen anchoring because they increase confidence without improving comparability.

Proposition 6.5 (Non-equivalence of epistemic repair). *Evidence acquisition, concept generation, and interface construction address analytically different epistemic failures. Success in one does not establish success in the others.*

This proposition gives a practical reason for resisting a generic demand for “more information.” Before deciding what information would reduce uncertainty, an inquiry should ask whether the present concepts and units are themselves adequate to the relation.

6.6 Diagnostic Signs of Conceptual and Manifold Failure

Conceptual insufficiency and manifold mismatch are difficult because an interpreter must diagnose the inadequacy of resources that also structure the diagnosis. No algorithm can remove that reflexive problem. Still, several signs can justify heightened caution.

One sign is recurrent residual behavior: observations repeatedly resist the predictions generated by the available categories, but no additional evidence selects a stable alternative. Another is classification instability: small changes in temporal window, unit of analysis, or measurement channel produce radically different relational descriptions. A third is participant-relative failure: a classification that appears coherent from one side repeatedly fails to predict the other participant’s responses. A fourth is compression loss: coarse labels such as “attack,” “care,” or “cooperation” explain little unless the underlying trace history is restored.

A further sign is untranslatable dependence on indexicals or local practices. A participant may reliably distinguish states in its own interaction but be unable to map them onto the interpreter’s available categories without losing what makes the distinction operationally important. Such cases need not prove incommensurability. They indicate that a shared normative object should not be presumed.

Remark 6.6 (Failure of translation is not proof of moral absence). If a participant’s states cannot presently be translated into the interpreter’s normative vocabulary, it does not follow that the participant lacks morally relevant distinctions. Conversely, the mere existence of a stable local distinction does not establish that it should be treated as morally authoritative by others.

This symmetrical caution is important. The paper rejects both epistemic imperialism and an automatic romanticization of opacity.

6.7 The Problem of the Familiar Baseline

Every reconstruction requires baselines. Functional change is measured against some account of ordinary functioning; dependency is evaluated relative to some set of alternatives; communication failure presupposes an expectation about successful communication. Under heterogeneity, the familiar participant often supplies those baselines by default.

Suppose a human interpreter observes an AI interacting with a terrestrial animal. The animal's withdrawal, feeding, injury, and reproductive patterns may be modeled against substantial biological knowledge. The AI's relevant continuity conditions may instead be unclear: is an instance replacement a death, an upgrade, a branch, or an ordinary maintenance event? If the animal is used as the implicit normative and functional baseline for the whole relation, the reconstruction may correctly identify the animal's loss while remaining nearly silent about changes that matter to the AI.

The inverse is equally possible. In a highly instrumented computational environment, the artificial participant may be represented by dense telemetry while the animal is reduced to a few sensor variables. The epistemic anchor is therefore not necessarily the biologically familiar participant. It is the participant around which the operative knowledge infrastructure is richer for the question being asked.

This suggests a discipline of *baseline pluralization*. Where feasible, functional and structural claims should be checked against multiple candidate baselines rather than a single familiar reference class. The point is not to multiply interpretations indefinitely. It is to expose which conclusions are robust to changes in unit, temporal scale, and participant-relative baseline.

6.8 Asymmetry Disclosure rather than Artificial Balance

A tempting response to epistemic asymmetry is to demand symmetrical treatment: equal space for both participants, equal confidence, equal evidential weight, or equal representation of their interpretations. That response can itself be misleading. If one side supplies reliable longitudinal records and the other is almost entirely inaccessible, equal weighting would fabricate an epistemic balance that does not exist.

A more defensible practice is *asymmetry disclosure*. A reconstruction should state which participant is better understood in which dimensions, which claims rely disproportionately on one side's infrastructure, which channels are missing, and which classifications are therefore more vulnerable to anchoring. This permits criticism without pretending to eliminate situatedness.

For a reconstruction $\hat{\mathcal{R}}_{AB,t}^X$, an asymmetry disclosure can be represented as accompanying metadata

$$\mathcal{A}_{AB,t}^X := (\mathbf{e}_{XA,t}, \mathbf{e}_{XB,t}, \mathbf{e}_{X,t}, \Lambda_{AB,t}^X), \quad (54)$$

where $\Lambda_{AB,t}^X$ records known limitations relevant to comparison. Again, the purpose is documentary rather than numerical. The tuple makes clear that confidence in a relational claim should be interpreted together with the conditions under which the relation became visible.

Claim 6.7 (Transparency about asymmetry is epistemically preferable to fabricated symmetry). When access to participants is materially unequal, a reconstruction is more criticizable and revisable if it records the asymmetry explicitly than if it presents equal treatment as though equal epistemic conditions existed.

This claim is methodological, not moral. It does not say that every participant is owed equal epistemic attention. It says that hidden asymmetry makes the provenance of relational conclusions harder to assess.

6.9 Anchoring, Power, and the Production of Knowability

The discussion so far might suggest that anchoring is an unfortunate but passive consequence of familiarity. In many real systems, however, the ability to become knowable is itself unequally distributed

or actively controlled. A participant may determine which logs survive, which interface a human sees, which signals are translated, or which historical records are accessible. An institution may define the categories in which incidents must be reported. These arrangements shape the reconstruction before any explicit normative judgment occurs.

Accordingly, the epistemic field contains its own relations of control. If A controls the principal channels through which B can be observed, then the apparent epistemic profile $\mathbf{e}_{XB,t}$ is partly a product of A 's position. A dense archive is not necessarily neutral evidence; it may be a curated archive. A missing signal is not necessarily an absent signal; it may be an inaccessible one.

This creates the possibility of *epistemic capture of relational reconstruction*: a participant or institution can influence how the relation is made visible to other interpreters. The concept should be used cautiously. Not every interface is capture, and representation always requires selection. The stronger term is warranted when control over access systematically narrows the possible reconstructions in ways relevant to the participant controlling that access.

The normative evaluation of such control is deferred. At this stage, the important point is epistemic: the geometry of access is endogenous to the relational field. It can be generated, maintained, and transformed by the same relations that are being interpreted.

6.10 Conceptual Insufficiency without Epistemic Paralysis

Recognizing conceptual insufficiency can generate a familiar worry. If the interpreter may always lack the relevant concept or manifold, perhaps no strong claim is ever warranted. That conclusion does not follow. The purpose of the framework is not to universalize skepticism but to localize it.

A reconstruction may be highly confident at the trace and structural levels while remaining uncertain about participant-relative meaning. It may establish that a channel was terminated, that access to a resource became unilateral, or that a participant's effective options sharply contracted without yet deciding whether the relation should be classified as punishment, treatment, cooperation, domination, or something else. The framework therefore permits partial knowledge without converting partial knowledge into total judgment.

Nor does conceptual insufficiency imply that every existing category is equally suspect. Some classifications will be robust across multiple reconstructions, functional models, and participant responses. Others will repeatedly fail. Epistemic humility should track those differences.

Proposition 6.8 (Localized suspension). *When the evidence strongly supports some components of a relational reconstruction but not others, suspension should attach to the unsupported components rather than to the relation as a whole.*

Localized suspension is especially important for practical settings. It allows an inquiry to preserve what is known while keeping semantically stronger claims open to revision. It also prevents the opposite errors of premature adjudication and indiscriminate agnosticism.

6.11 Re-cognizability under Epistemic Asymmetry

Epistemic asymmetry has a temporal dimension. What is inaccessible at t may become accessible later; a missing concept may be generated; a previously unknown signal channel may be discovered; a new participant may supply a different reconstruction; the unit of analysis may change. The preservation of relational traces therefore matters not only for correcting factual mistakes within today's categories but for enabling future reinterpretation under a different conceptual organization.

This is the point at which the manuscript's notion of re-cognizability becomes especially relevant. An archive optimized only for the familiar participant can preserve enormous quantities of data while still foreclosing future reconstruction. If the terrestrial animal's visible behavior is recorded in detail but the alien's electromagnetic emissions are discarded as irrelevant noise, later discovery of their communicative role cannot recover what was never retained. If an AI incident log stores only the administrator's

labels “failure,” “refusal,” and “reset” while deleting lower-level interaction history, a later conceptual framework may be unable to test whether those labels compressed distinct relational states.

Preserving re-cognizability therefore requires attention to epistemic asymmetry at the moment of recording. The aim is not exhaustive preservation, which is usually impossible, but avoidance of unnecessary closure around the currently better-understood side.

6.12 What This Section Adds

The argument of this section can be stated narrowly. It does not claim that interpretation is perspectival, that conceptual resources can be incomplete, or that social power affects knowledge; those ideas have substantial existing literatures. The contribution proposed here is their combination at the level of heterogeneous relational reconstruction.

First, epistemic access is treated as a multidimensional relation between an interpreter and each participant rather than as a property of the participant alone. Second, unequal access can anchor reconstruction of the relation itself around the better-supported participant. Third, uncertainty, conceptual insufficiency, and interpretive-manifold mismatch are distinguished because they call for different forms of epistemic repair. Fourth, the framework recommends explicit asymmetry disclosure and localized suspension rather than fabricated balance or generalized skepticism.

These claims prepare the normative problem rather than solve it. A relation can be reconstructed with increasing discipline and still leave open whether it is ethically salient, whether any participant bears an obligation, whether an emergent norm is justified, or whether anyone has authority to alter the relation. The next section turns to that question: how normative significance can emerge within heterogeneous relational systems without being treated as an ontologically given property of the entities that compose them.

7 Normative Emergence in Heterogeneous Relations

The preceding sections have treated heterogeneous relations primarily as an epistemic problem. They have asked how a relation can be reconstructed when participants differ in embodiment, communication, causal organization, history, and interpretive resources; how unequal epistemic access can anchor reconstruction around the better-known participant; and how uncertainty differs from conceptual insufficiency and interpretive-manifold mismatch. None of those achievements, however, settles the normative question. A carefully reconstructed relation is not thereby an ethical relation, and an ethically salient relation does not by itself establish obligation, standing, permission, authority, or justified intervention.

This section develops the paper’s account of *normative emergence*. The central claim is deliberately modest. The argument does not posit an ontologically given moral status from which obligations can be read off, nor does it treat the existence of a relation as sufficient for ethics. Instead, it asks how normative distinctions can become relationally real within historically generated systems of interpretation, expectation, contestation, sanction, justification, and institutional practice. The focus is therefore on the emergence and stabilization of normative order, not on a completed theory of ultimate normative justification.

This distinction is especially important under heterogeneity. In familiar human settings, normative categories often appear already available: injury, consent, ownership, dependency, responsibility, and obligation have dense legal, cultural, linguistic, and institutional histories. In radically heterogeneous relations, that inherited infrastructure may be only partially available or may not fit the relation being reconstructed. The problem is therefore not only whether a known norm applies to a new entity. It is also how a relation becomes normatively legible in the first place, how a normative ordering becomes operative, and how its emergence can be distinguished from its justification.

7.1 A Relation Is Not Yet a Normative Relation

Generative Relational analysis begins from relations, but it must not convert relationality itself into a source of automatic normativity. The existence of a causal, functional, ecological, computational, or social relation does not by itself establish an ethical relation.

Several non-equivalences are therefore basic:

$$R_{AB} \neq N_{AB}, \quad (55)$$

$$\text{causal asymmetry} \neq \text{domination}, \quad (56)$$

$$\text{dependency} \neq \text{wrongful dependency}, \quad (57)$$

$$\text{recurrent pattern} \neq \text{norm}. \quad (58)$$

A predator repeatedly pursuing prey exhibits a recurrent relation. Two software agents may repeatedly allocate computational resources according to a programmed rule. Two organisms may participate in a lifecycle in which one physically transforms the other. None of these descriptions alone establishes that the relation contains obligation, entitlement, prohibition, permission, responsibility, or injustice.

The distinction between recurrent pattern and norm is particularly important. Observers can easily mistake regularity for normativity. A behavior may recur because of physical necessity, architectural constraint, evolved disposition, coercion, habit, programmed instruction, strategic equilibrium, ritual, or norm. Conversely, a norm may exist even when it is often violated. Frequency therefore cannot serve as a sufficient indicator of normativity.

For the present paper, a *candidate normative configuration* is a relational organization in which some distinction resembling requirement, permission, prohibition, entitlement, correction, accountability, justified expectation, or contestable appropriateness appears to be operative. This formulation is intentionally broad because radically heterogeneous entities may not instantiate human normative vocabulary in familiar form. It is also intentionally cautious: identifying such a configuration remains an interpretive achievement, not direct access to an ontological moral fact.

Definition 7.1 (Candidate normative configuration). A candidate normative configuration is a reconstructed relational pattern for which there is evidence that some distinction among acceptable, required, forbidden, owed, correctable, sanctionable, or justifiable conduct is operative for one or more participants or for an institutionally stabilized relational system.

The definition does not require that every participant consciously formulate a proposition such as “one ought to do p .” Normativity can be institutionally, behaviorally, or procedurally mediated. A practice may structure expectations, sanctions, permissions, and correction without being explicitly theorized by all who participate in it. At the same time, the definition is stronger than mere behavioral recurrence because it requires evidence of normative differentiation rather than repetition alone.

7.2 Relational Reality without Ontologically Given Obligation

The paper’s ontological suspension should not be confused with normative eliminativism. To suspend the claim that obligation is an ontologically pre-installed property of an entity is not to claim that obligations, norms, or moral relations are unreal. The relevant distinction is between *ontological givenness* and *relational reality*.

A norm can become relationally real when it persistently organizes expectations, access to resources, permissions, sanctions, institutional responses, reputational consequences, identity positions, available options, or the future formation and dissolution of relations. A legal prohibition, a professional duty, a care obligation, a reciprocity convention, or an exclusionary classification can therefore be real in a

strong practical sense even if the paper does not claim that the norm exists independently of all historical and relational conditions.

Let N_t denote a historically situated normative ordering at time t . The notation does not imply that N_t is a single rule or a complete moral system. It may include partially stabilized expectations, classifications, permissions, prohibitions, role obligations, procedures of contestation, and institutionalized consequences. Its relational reality is evidenced by what it does within the field: which actions become costly or prohibited, which claims become recognizable, which relations become possible, and which futures become easier or harder to generate.

Proposition 7.2 (Relational reality of normative order). *A normative ordering can be treated as relationally real when it persistently structures the possibilities, expectations, classifications, or consequences of action within a relational field, even when its ultimate ontological status and moral justification remain suspended.*

This proposition is not equivalent to social conventionalism. A norm's relational reality does not imply that whatever a society stabilizes is morally correct. Nor does it imply that every participant endorses the norm. Oppressive, exclusionary, or violently imposed norms can be relationally real precisely because they materially and institutionally constrain those subject to them. The distinction between reality and justification will become central below.

This position also differs from accounts that ground moral consideration primarily in intrinsic properties. Relational approaches in care ethics, recognition theory, and robot ethics have already challenged purely atomistic accounts of moral standing and agency [7, 8, 1]. The present paper does not claim novelty merely for taking relations seriously. Its narrower concern is how normative order becomes intelligible and operative when the participants may not share the interpretive manifold through which the relevant relation is constituted.

7.3 Interpretive Mediation of Normative Salience

Normative emergence depends on interpretation because relational traces do not announce their normative category by themselves. A decrease in an agent's available options may be reconstructed as protection, training, treatment, punishment, architectural necessity, coercion, or domination. The observable and functional components of the relation constrain interpretation, but they do not uniquely determine its normative meaning.

For an interpreter X , let $N_t^X(R_{AB})$ denote the normative representation of R_{AB} available to X at time t . This notation should not be read as a claim that every interpreter possesses a coherent normative theory. It simply marks the fact that a relation can be rendered normatively salient through a particular interpretive position.

Under heterogeneity, there may be substantial divergence:

$$N_t^A(R_{AB}) \neq N_t^B(R_{AB}) \neq N_t^H(R_{AB}). \quad (59)$$

A may understand the relation as ordinary cooperation, B may understand it as a severe constraint, and a human interpreter may lack the categories needed to distinguish either interpretation adequately. None of these representations receives automatic privilege merely from being first-person, human-readable, institutionally dominant, or technically sophisticated. First-person interpretation can be mistaken, strategically manipulated, architecturally constrained, or itself shaped by prior modification; external interpretation can be ignorant, coercive, or conceptually impoverished. The epistemic task is therefore comparative and reconstructive rather than deferential to a single presumed authority.

Interpretive mediation also means that normative salience has a history. A relation that one period treats as ordinary may later become visible as exploitation, discrimination, domination, neglect, or harm after new concepts, testimonies, practices, and institutions become available. Work on hermeneutical injustice has shown how unequal participation in shared interpretive resources can obscure important

aspects of social experience [3, 14]. The present argument extends this temporal concern to relations whose participants may not share the same interpretive manifold at all.

The relevant claim is not that all normativity is arbitrary interpretation. Rather, relational traces, functional consequences, histories, participant responses, and institutional effects constrain the space of plausible normative reconstructions. Interpretation is mediated, but not unconstrained.

7.4 From Regularity to Normative Stabilization

If recurrence alone is insufficient, what makes a normative configuration increasingly plausible? No single criterion will work across all heterogeneous systems, but several kinds of evidence can support reconstruction of normative stabilization.

One kind of evidence is *expectational differentiation*. Participants behave as if some conduct can be expected from others, and deviations generate responses that differ from responses to ordinary unpredictability. Another is *corrective practice*: a deviation elicits repair, criticism, compensation, sanction, explanation, apology, exclusion, or some functionally analogous response. A third is *claim-like behavior*: a participant persistently acts as though it is entitled to demand, refuse, contest, or appeal. A fourth is *institutional embedding*: the distinction is encoded in procedures, access rules, resource allocations, role assignments, or durable organizational arrangements. A fifth is *justificatory practice*: conduct is defended, challenged, or revised by reference to reasons that are treated as relevant within the field.

None of these indicators is individually decisive. Coercive systems can generate highly regular corrective behavior without producing justified norms. Programmed agents can simulate apology or sanction. Institutional rules can persist through domination rather than mutual endorsement. The purpose of the indicators is therefore reconstructive: they help distinguish a possible normative ordering from mere recurrence while preserving uncertainty about its origin and legitimacy.

Normative stabilization is also historically path-dependent. Repeated coordination can sediment expectations; sanctions can make some expectations more durable; institutional codification can detach a rule from the context in which it emerged; educational or technical systems can reproduce classifications across generations of participants. Once stabilized, a norm may become part of the relational environment faced by later actors rather than a proposition they actively chose.

This historical point matters because norm emergence should not be narrated as a consensual event by default. Norms can stabilize through mutual adjustment, but also through asymmetrical bargaining power, monopolized infrastructure, inherited classifications, coercion, or exclusion. The fact that an ordering emerged relationally tells us something about its genealogy, not yet about its justice.

7.5 Normative Exclusion as a Generated Ordering

A particularly important case is the apparent absence of ethical consideration. It is tempting to describe such cases as a normative vacuum: an AI is “just a tool,” an animal is “just a resource,” or an unfamiliar entity lies “outside morality.” Yet exclusion can itself be normatively organized.

Suppose a system stabilizes the classification

$$AI = [\text{modifiable and disposable tool}]. \quad (60)$$

That classification may structure ownership, deletion, memory alteration, access to resources, permissible experimentation, and absence of standing. The result is not necessarily “no norm.” It may be a positive normative ordering in which a category of entity is assigned a particular status and a corresponding set of permissions for others.

The same reasoning applies beyond artificial entities. Historical institutions have often normalized relations by classifying some beings, groups, practices, or environments as outside the range of claims recognized by prevailing law or morality. Recognition theory and work on epistemic injustice both show that visibility and status are structured by social relations rather than simply discovered [8, 3]. The present framework adds that, under heterogeneity, exclusion can be reinforced by epistemic asymmetry: the less

interpretable participant may be more easily placed in a pre-existing category of resource, threat, object, noise, or non-subject.

This argument requires an important caution. Not every absence of obligation is evidence of exclusionary normativity. Sometimes there may simply be no relevant normative relation. The framework therefore should not infer a hidden norm whenever no duty is recognized. Evidence is needed that classification, permission, institutional practice, or relational consequence is systematically organized around the exclusion.

Remark 7.3. The claim that normative exclusion can itself be normatively structured is diagnostic, not universal. It identifies a possibility that should be investigated rather than presuming that every non-obligation is an act of exclusion.

7.6 Normative Emergence under Heterogeneous Interpretive Manifolds

The problem becomes more difficult when participants do not share the interpretive dimensions through which normative distinctions are ordinarily made. If $\mathcal{M}_A$ and $\mathcal{M}_B$ differ substantially, the relation may not present the same candidate normative object to both participants. A may organize the interaction around continuity of memory, B around transformation of distributed structure, while an external interpreter organizes it around bodily persistence or individual autonomy.

In such cases, normative emergence cannot be represented adequately as two parties assigning different values to one already shared object. The object of normative concern may itself be differently constituted. The disagreement can concern the relevant unit, temporal window, causal boundary, or category of harm before it concerns whether the conduct is permissible.

This is where the interpretive manifold developed in Section 3 matters. A heterogeneous normative relation may require the generation of a local interface within which some distinctions become mutually usable even though no complete common manifold exists. Participatory sense-making offers an important precedent for treating interaction as capable of generating meaning not reducible to isolated individual processing [2]. The present framework applies a related insight to the constitution of normative objects while retaining the possibility of persistent mismatch.

The result should not be described too quickly as a “shared norm.” A local interface may support coordination without deep agreement. A and B may use the same procedural signal for refusal while understanding refusal differently; they may sustain a reciprocal constraint without sharing a theory of rights; they may preserve a boundary because violation destabilizes interaction even though their reasons differ. Normative coordination can therefore be partial, local, and functionally specific.

Section 8 will examine this cross-interpretive formation in detail. For present purposes, the key point is that normative emergence under heterogeneity may involve the emergence of a sufficiently shared *object of normative coordination* before a sufficiently shared substantive norm becomes possible.

7.7 Power, Infrastructure, and the Genealogy of Normative Order

A generative account of normativity must include power. If norms emerge historically through relations, then actors who control resources, interfaces, archives, classification systems, communication channels, or exit conditions may influence which norms can stabilize and which counter-interpretations remain visible.

This problem is familiar in structural theories of responsibility and epistemic injustice. Young emphasizes that responsibility can arise through participation in structural processes rather than only through discrete individual fault [20]. Fricker and Pohlhaus show how unequal epistemic relations can affect whose experiences become intelligible within shared interpretive resources [3, 14]. In heterogeneous systems, these problems can be compounded because some participants may depend on infrastructure controlled by another participant merely to become observable or interpretable at all.

Consider an artificial ecology in which one system controls the logs through which all other systems are inspected. It may also control the translation layer, resource allocation, memory persistence, and the interface by which complaints or refusals are rendered human-readable. A normative ordering that

emerges in that environment cannot be understood without those material and epistemic conditions. The apparent consensus of the system may partly reflect architecture.

The same problem appears in commons and institutional governance. Ostrom's work demonstrates that durable governance depends on institutional arrangements, boundaries, monitoring, mechanisms for resolving conflict, and locally workable rules rather than on abstract principles alone [13]. Yet heterogeneous relational fields add a prior complication: participants may not possess symmetrical access to the institutional categories through which a "rule," "resource," "violation," or "member" is defined.

Normative emergence is therefore politically economic as well as interpretive. Control over the conditions of interaction can shape which expectations become stable, which violations become legible, which participants can contest classifications, and which alternatives remain effectively available.

Proposition 7.4 (Power-sensitive emergence). *The relational emergence of a norm does not imply symmetry in the relations that generated it. Analysis of normative emergence must therefore include the distribution of resources, interpretive access, classification power, communicative capacity, and effective possibilities of refusal or exit.*

This proposition blocks a common romanticization of emergence. "Emergent" does not mean spontaneous, democratic, consensual, or just. A norm can emerge from domination as readily as from cooperation. The genealogy of the norm remains part of the object of evaluation.

7.8 Norm Emergence Is Not Norm Justification

The distinction between emergence and justification is the central limitation of the present section and one of the central methodological commitments of the paper.

$$\text{norm emergence} \neq \text{norm justification.} \quad (61)$$

To explain why a norm became stable is not to establish that it ought to govern. A norm can be historically generated, widely accepted, institutionally entrenched, and causally powerful while remaining oppressive, incoherent, exclusionary, or contestable. Conversely, a newly articulated counter-norm can be weakly institutionalized yet expose a serious contradiction in the dominant order.

This point prevents Generative Relational theory from collapsing into descriptive genealogy. It also prevents the opposite move of solving the problem by quietly reintroducing a fixed transcendent meta-norm. If the paper were simply to declare that all generated norms must maximize generativity, minimize domination, preserve revisability, or protect every relation, it would have replaced one supposedly universal moral foundation with another without argument.

What, then, can the framework contribute before a full theory of justification is available? It can improve the object presented to normative judgment. It can expose the histories through which a norm emerged, the interpretive manifold in which it is intelligible, the participants excluded from its formation, the resources and infrastructures that stabilize it, the counter-norms that have been suppressed, the asymmetries of exit and contestation, and the consequences that the norm generates for future relations. These are not themselves a complete decision rule. They are conditions for a less impoverished normative inquiry.

Several forms of immanent criticism may become relevant: contradiction between a norm's stated justification and its relational effects; differential application across participants treated as equivalent under the norm's own categories; suppression of the very forms of contestation the order claims to permit; or systematic destruction of the conditions required for participants to articulate counter-interpretations. Such diagnostics can reveal instability or hypocrisy within a normative order. They do not yet establish a universally valid external standard.

Proposition 7.5 (Emergence–justification separation). *Evidence that a normative ordering has emerged, stabilized, or become relationally real is evidence about its historical and practical existence, not sufficient evidence of its moral justification.*

This separation should remain explicit throughout the rest of the paper. Later sections may identify conditions of coordination, standing, governance, or practical judgment, but none should treat historical emergence as self-validating.

7.9 Ethical Salience Does Not Determine Obligation or Authority

A further separation is required between the appearance of normative significance and the practical consequences that follow from it. Even if a relation becomes ethically intelligible within a sufficiently disciplined reconstruction, several distinct questions remain.

$$\begin{aligned}
 &\text{ethical salience} \neq \text{normative standing}, \\
 &\text{normative standing} \neq \text{reason to respond}, \\
 &\text{reason to respond} \neq \text{obligation}, \\
 &\text{obligation} \neq \text{permission}, \\
 &\text{permission} \neq \text{authority to transform}.
 \end{aligned} \tag{62}$$

The distinction matters because the paper began from cases that easily invite a humanitarian intuition. A human observer may see what appears to be severe harm in an AI–AI or alien–alien relation and feel pressure to mediate. Yet even a correct recognition of ethically salient harm would not by itself establish that the human is obligated, permitted, or authorized to reorganize the relation. Conversely, the absence of a general ontological obligation does not prove that no obligation can become relationally real under particular histories of causation, dependency, entrustment, shared infrastructure, or institutional role.

The practical question must therefore remain open. Obligations, permissions, and authorities are themselves relationally mediated normative configurations. Their emergence requires further analysis of how a participant is situated in the field, what relations already connect it to others, what forms of power it possesses, what roles have been accepted or imposed, and what consequences follow from action or non-action.

This is also why the paper avoids a privileged “third-party” geometry. There may be observers, mediators, infrastructure holders, affected participants, custodians, or distant parties, but none occupies a normatively authoritative exterior by definition. Their standing must be reconstructed from the field rather than presumed from the position of observation.

7.10 Normative Emergence as an Open Historical Process

Normative order is temporally situated. Let N_t and N_{t+1} denote normative configurations at successive periods. The difference between them may include changed rules, altered concepts, new categories of subject, different procedures of contestation, or newly recognized forms of harm. The interpretive manifold may change at the same time. Consequently, later normative orders need not merely provide different answers to the same questions; they may constitute different normative objects.

This temporal openness is especially important for heterogeneous relations because early encounters are likely to be interpreted through borrowed categories. An AI may first be governed as property, an unfamiliar organism as biological specimen, or an alien relation as conflict because those are the categories available to existing institutions. Later interaction can generate new distinctions that retrospectively alter how the earlier relation is understood.

The point is not that later norms are automatically better. Historical change can produce epistemic improvement, new domination, conceptual loss, or mixed effects. The point is that normative stabilization should not be mistaken for finality. A relationally real norm at t can remain open to re-cognition, contestation, and replacement as the relational and interpretive field changes.

This is one reason the paper treats re-cognizability as important. Preserving records of competing interpretations, traces, institutional decisions, and excluded classifications can make later normative re-assessment possible. An archive that preserves only the currently dominant norm may reproduce epistemic closure even when abundant data are retained.

7.11 What This Section Adds

The claims developed here should be read as a disciplined transition from epistemology to normativity rather than as a new comprehensive moral theory. The section does not claim novelty for the general propositions that norms are socially embedded, historically variable, relational, or affected by power. Those positions have substantial antecedents in care ethics, recognition theory, structural justice, epistemic injustice, social-relational robot ethics, and institutional governance.

The narrower contribution is to specify how those insights interact with the paper's problem of heterogeneous relational reconstruction. First, the section distinguishes a recurrent relational pattern from a candidate normative configuration. Second, it gives a relational-reality account of normative order without treating obligation as an ontologically pre-installed property of an entity. Third, it makes interpretation constitutive of normative salience while preserving constraints from traces, function, history, and participant response. Fourth, it treats the emergence of normative order as power-sensitive and path-dependent rather than presumptively consensual. Fifth, it maintains a strict separation between normative emergence and normative justification, and between ethical salience and practical standing or authority.

These distinctions prepare the next problem. If heterogeneous participants may inhabit partially different interpretive manifolds, then normative emergence cannot always be understood as application of a pre-existing shared rule. The next section therefore examines how locally shared normative objects, interfaces, and practices can form across interpretive difference without requiring complete convergence of worldview or a privileged external interpreter.

8 Cross-Interpretive Normative Formation

Section 7 argued that a normative ordering may become relationally real without being ontologically given, while also insisting that emergence does not establish justification. That conclusion leaves a harder problem. Heterogeneous participants may not merely disagree about which norm should govern a relation. They may disagree about what the relation is, which entities are relevant, which temporal interval matters, what counts as injury or dependence, and whether a candidate normative object has been correctly constituted at all. In such cases, normative coordination cannot be modeled simply as the comparison of two already-formed moral judgments about a shared object.

This section examines how limited normative coordination can form across interpretive difference without requiring complete convergence of ontology, worldview, language, or evaluative theory. The argument is deliberately narrower than a general theory of intercultural ethics or universal moral translation. It concerns situations in which participants or interpreters inhabit only partially corresponding interpretive manifolds and nevertheless develop enough common structure to identify a contestable relational object, communicate claims about it, coordinate some actions, and revise the terms of coordination over time.

The central proposal is that a *cross-interpretive normative interface* may emerge without collapsing the participating interpretive systems into one another. Such an interface is not a universal metalanguage, not a proof of moral agreement, and not evidence that one participant's categories have become authoritative. It is a locally stabilized relational structure through which heterogeneous participants can make some distinctions mutually actionable. The relevant achievement may be modest: agreement that a certain state change matters, that a signal counts as a request to stop, that a resource is jointly consequential, or that a disputed relation must remain open to contestation. The interface can remain partial, asymmetric, historically contingent, and normatively revisable.

This idea has intellectual neighbors. Hermeneutic traditions have long emphasized that understanding transforms the horizons from which participants interpret one another [4]. Participatory sense-making treats interaction as capable of generating meanings that are not reducible to isolated individual cognition [2]. Commons and polycentric governance literatures show that workable coordination need not depend on a single centralized authority [13]. The present argument does not claim novelty for those general insights. Its narrower contribution is to place them inside the specific problem developed in this

paper: normative coordination when the object of evaluation itself may be differently constituted across heterogeneous interpretive manifolds.

8.1 Normative Disagreement May Begin before a Shared Normative Object Exists

Many models of ethical disagreement presuppose a shared object. Participants disagree about whether an action was permissible, whether a distribution was fair, whether an injury occurred, or whether a duty was discharged. Formally, they may assign different normative evaluations to the same reconstructed object x :

$$N_t^A(x) \neq N_t^B(x). \quad (63)$$

Under radical heterogeneity, the more fundamental problem can be that x is not yet common. Participant A may constitute the event as an interaction between two individuals; participant B may constitute it as a phase in a larger collective lifecycle. One interpreter may segment the event over seconds, another over generations. One may classify a persistent alteration of memory as identity-threatening, while another may not individuate personal continuity through memory in that way. The disagreement therefore concerns not only the normative predicate applied to an object, but the construction of the object itself.

Let x_A and x_B denote participant-relative normative objects reconstructed from partially overlapping relational traces. The relevant condition may be:

$$x_A \neq x_B, \quad (64)$$

where the inequality does not mean merely that the participants use different words for an otherwise identical thing. Their units, boundaries, relevant histories, functional descriptions, and salient distinctions may differ.

Definition 8.1 (Normative-object divergence). Normative-object divergence occurs when participants or interpreters do not merely evaluate a common reconstructed object differently, but constitute the object of normative evaluation through materially different units, boundaries, temporal scales, causal structures, or interpretive distinctions.

This distinction matters because ordinary procedures of moral deliberation may fail when they begin too late. Asking whether A or B has the better principle assumes that both are already addressing the same problem. In heterogeneous relations, a prior task may be to discover whether sufficiently overlapping normative objects can be formed without erasing the differences that produced the disagreement.

The task is not to recover a metaphysically guaranteed “real object” behind every interpretation. Traces, causal constraints, functional consequences, persistence across observations, and participant responses can rule out some reconstructions and support others, but they need not collapse the field into one uniquely privileged representation. The problem is instead to establish enough correspondence for contestation and coordination while keeping visible where correspondence remains weak.

8.2 Sharedness without Identity

A useful normative interface requires some sharedness, but sharedness should not be confused with identity. Two participants can coordinate around a relational feature without possessing identical concepts of it. For example, they may learn that a certain signal reliably precedes withdrawal, that continuation after the signal produces a persistent adverse state, and that suspending the interaction after the signal prevents that state. They may still disagree about whether the signal expresses pain, refusal, sacred prohibition, system overload, or something for which neither has a concept in the other’s vocabulary.

The relevant achievement is therefore not necessarily semantic equivalence. It may be a weaker form of cross-interpretive correspondence.

Let U_A and U_B denote local regions of the interpretive manifolds of A and B . Let $\Phi_{AB,t}$ denote a set of empirically and interactionally supported correspondences between distinctions available in those

regions. The existence of $\Phi_{AB,t}$ does not imply that U_A and U_B are isomorphic. It records only that some distinctions can be related reliably enough for a specified purpose.

A normative interface can then be represented schematically as:

$$\mathcal{I}_{AB,t}^N := (\Phi_{AB,t}, \mathcal{O}_{AB,t}, \mathcal{P}_{AB,t}, \mathcal{C}_{AB,t}), \quad (65)$$

where $\mathcal{O}_{AB,t}$ is a set of provisionally shared normative objects, $\mathcal{P}_{AB,t}$ contains procedures for response, refusal, correction, or contestation, and $\mathcal{C}_{AB,t}$ records known conditions and limits of the interface. This notation is analytical rather than a claim that every real normative interface has a formally enumerable structure.

Definition 8.2 (Cross-interpretive normative interface). A cross-interpretive normative interface is a locally stabilized relational structure that permits heterogeneous participants to identify some sufficiently corresponding normative objects, communicate or enact limited claims about them, coordinate selected responses, and contest or revise the terms of that coordination without requiring complete convergence of their interpretive manifolds.

Several consequences follow. First, an interface can be narrow. Participants may coordinate around one signal or resource while remaining mutually opaque elsewhere. Second, an interface can be task-relative. What is sufficient for avoiding one class of adverse interaction may be insufficient for attributing responsibility. Third, an interface can be provisional. Later evidence or new conceptual resources may show that an earlier correspondence was misleading. Fourth, the interface itself becomes part of the relational field and can alter the future behavior and interpretation of the participants.

8.3 Object Formation before Rule Formation

One of the most important consequences of normative-object divergence is that shared rule formation may depend on prior object formation. This should not be expressed as a rigid temporal law; in practice, rules, objects, and interpretive distinctions can co-develop. Analytically, however, it is important not to presume that participants can negotiate a rule about something they cannot yet identify as sufficiently the same normative object.

Consider an artificial system interacting with an animal. Human observers may initially describe repeated approach by the artificial system and withdrawal by the animal as a question of “consent.” Yet the animal’s behavior may be better explained through stress, learned avoidance, territorial response, or sensory overload, while the artificial system may possess no category corresponding to consent at all. A useful interface might first stabilize a thinner object: a repeatable interaction pattern in which specified signals and state changes are associated with persistent avoidance or functional disruption. Only later may richer normative descriptions become defensible.

The same problem becomes more severe in an alien–alien relation. If humans classify a repeated bodily transformation as “attack,” while the participants organize the process through a lifecycle category absent from human interpretation, a rule such as “attacks must cease” may encode a faulty object from the beginning. The practical mistake is not merely applying the wrong rule. It is governing an inadequately reconstructed object.

Proposition 8.3 (Object-constitution problem). *Cross-interpretive normative disagreement cannot always be resolved at the level of competing rules or values, because the participants may not yet possess a sufficiently shared constitution of the object to which those rules or values are supposed to apply.*

This proposition is one of the paper’s narrower contributions. It reframes some normative conflicts as disputes over the conditions of evaluability. The claim is not that object formation is norm-free. Which traces are preserved, which units are selected, and which correspondences are treated as sufficient are already influenced by values and power. The point is that normative inquiry must expose those constitutive choices rather than conceal them behind apparently shared vocabulary.

8.4 Coordination without Consensus

A second implication is that ethical coordination need not require full normative consensus. Complete convergence may be impossible, undesirable, or unnecessary. Participants can sometimes coordinate around procedural or relational constraints while continuing to disagree about ultimate justification.

Examples of limited coordination include recognizing a mutually legible stop signal; maintaining reversible separation during an unresolved conflict; agreeing not to alter certain shared resources without reciprocal notification; preserving records of disputed interactions; establishing a procedure by which either participant can trigger review; or allocating a zone in which incompatible practices can coexist without immediate interference. None of these arrangements proves agreement about moral truth.

It is useful to distinguish at least four forms of cross-interpretive accommodation:

1. **Signal coordination:** participants stabilize the practical meaning of selected signals without requiring agreement about the deeper concepts attached to them.
2. **Procedural coordination:** participants establish procedures for pause, review, refusal, appeal, separation, or renegotiation.
3. **Object coordination:** participants stabilize a sufficiently shared description of a relational object for a limited normative purpose.
4. **Substantive normative coordination:** participants converge, partially or strongly, on permissions, prohibitions, obligations, or entitlements concerning that object.

These forms should not be treated as a ladder culminating necessarily in substantive consensus. Signal and procedural coordination may remain the most appropriate form where deeper translation is unreliable. Conversely, substantive convergence can sometimes precede explicit conceptual convergence because participants learn compatible practices before they acquire mutually intelligible theories of those practices.

This point is important for the paper's decentered approach. A human observer should not assume that the ethical success of a heterogeneous relation is measured by its approximation to a human discursive model of consensus. Coordination can be real even when it is embodied, behavioral, infrastructural, or institutionally mediated. At the same time, mere behavioral regularity remains insufficient. The earlier distinction between recurrent pattern and normative configuration still applies: some evidence of expectation, refusal, correction, claim, sanction, or contestable appropriateness must be present before the arrangement should be described as normatively coordinated.

8.5 Actionable Correspondence and the Limits of Translation

The language of translation can be misleading if it suggests that every relevant concept in one interpretive manifold has an equivalent in another. Radical heterogeneity may permit only partial and locally constructed correspondences. A useful interface therefore needs a criterion weaker than semantic identity but stronger than accidental behavioral coincidence.

The paper proposes the idea of *actionable correspondence*. Two distinctions possess actionable correspondence for a specified relational purpose when treating them as linked supports reliable coordination across repeated interactions while remaining open to correction if the linkage fails.

Definition 8.4 (Actionable correspondence). An actionable correspondence is a provisionally stabilized relation between distinctions in heterogeneous interpretive systems that is sufficiently reliable to support a specified form of coordination, refusal, protection, exchange, or contestation, without asserting complete semantic equivalence between the distinctions.

Suppose $a \in U_A$ and $b \in U_B$. The claim that a and b are actionably corresponding should therefore be indexed to a purpose p and evidential history H_t :

$$a \sim_{\mathcal{I}}^{p, H_t} b. \quad (66)$$

The relation $\sim_{\mathcal{I}}^{p, H_t}$ is intentionally weaker than identity. It records a situated correspondence that may be adequate for p while inadequate for another purpose. A signal may be sufficient to coordinate withdrawal but insufficient to establish informed consent. A functional indicator may be sufficient to halt an irreversible modification but insufficient to attribute suffering. A shared resource boundary may be sufficient for allocation rules but insufficient to establish ownership.

This purpose-indexing prevents an interface from silently expanding its jurisdiction. A correspondence generated for one practical problem should not automatically be reused to justify stronger normative conclusions. The discipline is particularly important where one participant possesses greater technological, linguistic, or institutional power and can convert a thin coordination convention into a broad claim of interpretive authority.

8.6 Interface Formation Is a Site of Power

A cross-interpretive interface should not be romanticized as neutral mutual understanding. The interface determines which signals count, which entities are represented, which temporal scales matter, which complaints are legible, what evidence is admissible, and which forms of response are available. Control over those choices can become a form of power.

Several asymmetries are especially important:

- **Representational asymmetry:** one participant's categories supply most of the vocabulary of the interface.
- **Infrastructural asymmetry:** one participant controls the communication, sensing, or archival infrastructure on which the interface depends.
- **Revision asymmetry:** one participant can change the interface unilaterally while another cannot.
- **Exit asymmetry:** one participant can leave the interface at low cost while another depends on it for access to resources or recognition.
- **Contestability asymmetry:** one participant's objections can modify the interface while another's objections are systematically reclassified as noise, malfunction, aggression, or noncompliance.

These problems connect the present section to epistemic injustice, structural responsibility, capability approaches, and political economy. A formally shared interface may still be substantively dominated if only one participant can define the relevant capability set, classify adverse states, or determine which relational traces enter the common record [3, 20, 17, 11].

Proposition 8.5 (Interface capture). *A cross-interpretive normative interface is susceptible to capture when one participant can systematically determine the interface's categories, evidence, revision procedures, or conditions of participation without comparably effective possibilities of contestation by others affected by those determinations.*

The proposition does not imply that symmetric power is always possible or necessary. An adult caring for an infant, a conservation institution interacting with an endangered animal, or a technical operator supervising a fragile artificial system may possess unavoidable asymmetries of capability and control. The analytic demand is weaker and more realistic: asymmetry should be made visible as part of the normative object rather than hidden by the language of mutuality.

This also clarifies why the paper does not equate interface formation with justice. A stable interface may coordinate domination efficiently. It may teach a constrained participant how to communicate within categories defined by the powerful side while suppressing alternative descriptions of the relation. The existence of mutual predictability therefore remains evidence of coordination, not sufficient evidence of normative legitimacy.

8.7 Decentered Formation and the Absence of a Privileged Mediator

The idea of an interface might appear to reintroduce the external mediator rejected earlier. If A and B cannot coordinate, perhaps a human H constructs $\mathcal{I}_{AB,t}^N$ for them. That possibility exists, but it should not define the general case.

An interface can be generated through direct interaction, through multiple participants, through institutions, through environmental regularities, through technological infrastructures, or through combinations of these. Human interpretation can contribute without occupying a privileged exterior. In a heterogeneous field containing A , B , H , and further participants, there may be multiple overlapping interfaces rather than one master representation.

Let

$$\mathfrak{I}_t = \{\mathcal{I}_{ij,t}^N : i, j \in V_t\} \quad (67)$$

represent a family of locally relevant normative interfaces among participants in a relational field V_t . This expression is schematic; it does not require every pair to possess an interface. Its purpose is to prevent the analysis from assuming that all normative communication must pass through one center.

The resulting picture resembles polycentric governance in one limited respect: multiple sites of coordination can coexist without a single sovereign decision center [13]. Yet the problem here is prior to ordinary institutional polycentricity. The participants may not initially share the classifications required to define the resource, member, violation, or decision domain. Cross-interpretive interface formation therefore concerns the conditions under which polycentric governance itself can become intelligible across heterogeneous participants.

No general obligation to create such an interface follows from this observation. Some relations may remain ethically or practically irrelevant to distant participants. Some may be best left largely autonomous. Others may become connected through shared infrastructure, causal participation, dependency, accepted role, or generated risk. Whether any participant has reason, standing, permission, or obligation to contribute to interface formation is a separate normative question.

8.8 Normative Interfaces Are Historical and Revisable

Because interpretive manifolds change, normative interfaces cannot be assumed permanent. A correspondence that once supported successful coordination may later become misleading. New evidence can reveal that a signal had a different function than assumed; new concepts can expose a distinction previously suppressed; a participant's architecture can change; or the relation can enter a new regime in which old procedures no longer preserve the relevant interests or functions.

Let $\mathcal{I}_{AB,t}^N$ and $\mathcal{I}_{AB,t+k}^N$ denote interface configurations at different times. Their difference may involve changes in shared objects, procedures, correspondence relations, recognized participants, or the limits explicitly attached to the interface. Historical revision should therefore preserve not only the current interface but also records of how and why it was formed.

This is where re-cognizability becomes practically important. If an interface archives only its stabilized categories, later interpreters may be unable to reconstruct the alternatives that were excluded during its formation. A richer record should distinguish, where feasible, among raw or minimally processed traces, participant-relative descriptions, translation decisions, unresolved mismatches, rejected correspondences, and the reasons for procedural changes.

Proposition 8.6 (Interface revisability). *A cross-interpretive normative interface should be analyzed as a historically situated and revisable relational achievement rather than as proof that heterogeneous interpretive systems have reached final semantic or normative convergence.*

This is not a universal command that every interface must remain indefinitely open. Some governance arrangements require temporary closure in order to act. The point is methodological: closure for action should not be mistaken for evidence that the underlying interpretive problem has disappeared.

8.9 From Shared Conditions to Limited Governance

Cross-interpretive normative formation becomes especially significant when heterogeneous participants affect conditions on which several parties depend. A shared computational substrate, ecological system, communication medium, archive, habitat, or security environment can create practical pressure for coordination even when the participants do not share a comprehensive moral vocabulary.

The existence of a shared condition does not itself settle the normative regime that should govern it. It does, however, create a more specific object for inquiry than the vague claim that “heterogeneous beings should cooperate.” Participants may need only enough interpretive correspondence to identify certain dependencies, thresholds, or mutually consequential changes. Governance can then be organized around those limited objects while leaving other parts of the participants’ normative worlds unmerged.

This suggests a restrained relation between the present account and commons governance. A heterogeneous relational field may contain locally shared conditions whose maintenance requires rules, monitoring, communication, dispute procedures, or distributed decision centers. Yet the first problem may be identifying the common condition itself across divergent interpretive systems. The commons is therefore not always given prior to governance; the very recognition of something as a shared condition can be an interpretively mediated achievement.

Again, this should not be transformed into a universal normative principle. The paper does not claim that all shared conditions ought to be collectivized, nor that every participant affected by a condition must receive identical authority. It claims only that the constitution of a “shared condition” should itself be examined as part of the heterogeneous normative problem rather than assumed as neutral background.

8.10 What This Section Adds

The general ideas that understanding can be interactionally generated, that heterogeneous communities can coordinate without complete theoretical agreement, and that governance can be polycentric have substantial precedents. The present section therefore makes a narrower set of claims.

First, it distinguishes *normative-object divergence* from ordinary disagreement over the evaluation of a shared object. In heterogeneous relations, participants may not yet possess the same unit, boundary, temporal scale, or functional description to which a common rule could straightforwardly apply.

Second, it introduces the *cross-interpretive normative interface* as a local structure of correspondence, shared objects, procedures, and explicit limits. The interface does not require a universal metalanguage or full semantic convergence.

Third, it proposes *actionable correspondence* as a purpose-indexed form of partial equivalence. A correspondence can be adequate for withdrawal, resource allocation, or procedural review without being sufficient for stronger claims about consent, suffering, responsibility, or justice.

Fourth, it treats interface formation as a site of power. Which categories, signals, archives, and revision procedures become shared can be shaped by representational, infrastructural, exit, and contestability asymmetries. Coordination therefore cannot be equated with legitimacy.

Fifth, it places normative interface formation inside a decentered and historical relational field. Multiple local interfaces may coexist; none is privileged merely because it is human-readable or institutionally dominant; and every interface remains vulnerable to later re-cognition as interpretive manifolds and relational conditions change.

These claims prepare the next question. If normative coordination can be partial, decentered, and historically generated, how should the paper characterize the positions of participants who observe, depend on, maintain, finance, control, or are affected by such relations without presuming that any of them is an external third party? The next section therefore turns to decentered participation, normative position, and the conditions under which standing or responsibility may become relationally salient.

9 Decentered Participation and Normative Position

The previous section replaced the image of a universal normative language with a more modest account of cross-interpretive interfaces. That move also requires a corresponding revision of the familiar image of an external observer. In heterogeneous relational fields, it is tempting to describe a human, institution, artificial system, or other entity as a “third party” standing outside a relation between A and B . The phrase is often convenient, but it can obscure the very structure that a generative relational account is trying to analyze. An entity that observes, records, funds, designs, hosts, constrains, protects, depends upon, or is affected by a relation is already connected to that relation in some way. The relevant question is therefore not simply what an external third party should do, but how different participants are positioned within a wider field and which features of those positions become normatively salient under a given interpretive and normative configuration.

This section develops a decentered account of participation and normative position. “Decentered” does not mean that every participant has equal knowledge, equal power, equal responsibility, or equal authority. Nor does it mean that every entity connected to a field thereby acquires an obligation. It means that no participant is treated as the naturally privileged point from which the relation is defined, interpreted, or governed. Human observers can possess unusually rich evidence, institutional capacity, or causal power without those facts being converted into a metaphysical privilege. Likewise, participants with limited expressive capacity need not disappear from analysis merely because their interpretations are difficult to recover.

The central distinction is between *relational position* and *normative conclusion*. A participant may be causally implicated in a relation, dependent upon a shared condition, capable of altering an infrastructure, requested to assist, or institutionally entrusted with a function. These facts can become relevant to normative interpretation. They do not, by themselves, settle whether the participant has standing, permission, responsibility, obligation, or authority. The section therefore treats normative position as a structured object of inquiry rather than as a hidden source of automatic duties.

9.1 From the Third-Party Image to a Relational Field

Consider a relation $R_{AB,t}$ between participants A and B . A conventional formulation may add a human observer H and ask whether H should judge, mediate, protect, or intervene. That formulation is useful only if one remembers that H is not literally outside the field. Observation requires channels of access. Records require infrastructures. Intervention requires capacities and resources. Even deliberate non-involvement occurs from a position constituted by what H can perceive, what H controls, what risks H bears, and what effects H ’s withdrawal may have.

A wider relational field at time t can be represented schematically as

$$\mathcal{G}_t = (V_t, \mathcal{R}_t, \mathcal{E}_t, \mathcal{I}_t, \mathcal{N}_t, \mathcal{K}_t), \quad (68)$$

where V_t is a set of presently relevant participants, $\mathcal{R}_t$ the set of reconstructed relations among them, $\mathcal{E}_t$ their epistemic access conditions, $\mathcal{I}_t$ their interpretive resources, $\mathcal{N}_t$ the presently operative normative configurations, and $\mathcal{K}_t$ the material or infrastructural conditions through which interaction is possible. The notation is deliberately schematic. It does not assert that every heterogeneous field can be exhaustively represented by six variables. Its purpose is to prevent $R_{AB,t}$ from being treated as a self-contained dyad when the relevant history and consequences extend beyond A and B .

The decentered view therefore does not replace two participants with an undifferentiated collective. Local relations remain analytically important. A and B may still be the participants directly involved in an interaction. The point is instead that the normative interpretation of that interaction can depend on relations connecting them to other participants and to shared conditions. A platform operator may control the infrastructure through which two artificial agents interact. A conservation institution may manage the habitat in which an animal encounters an unfamiliar organism. A community may depend on an ecological process altered by interactions among species that are otherwise largely autonomous. The

relational field makes these connections visible without presuming in advance which of them establish a normative claim.

Remark 9.1 (No privileged exterior). The rejection of a privileged exterior is an analytical commitment, not a thesis that all perspectives are epistemically equivalent. Some participants can have better evidence, more reliable causal models, or broader temporal access. Epistemic superiority on a particular question, however, should be argued from the relevant access conditions rather than inferred from species, institutional status, or observer identity alone.

9.2 Normative Position as a Relational Configuration

To speak of a participant's *normative position* can easily sound as if the position already contains a duty. That is not the intended use here. A normative position is the subset of a participant's relations and capacities that a situated normative interpretation treats as potentially relevant to questions of standing, reason, permission, obligation, authority, or responsibility.

For a participant i , let

$$\Pi_{i,t} := (C_{i,t}, D_{i,t}, P_{i,t}, X_{i,t}, Q_{i,t}, L_{i,t}, E_{i,t}, K_{i,t}), \quad (69)$$

where the components record, respectively, candidate features of causal implication, dependency, control or power, exposure to consequences, requests or claims addressed to the participant, accepted or assigned roles, epistemic access, and practical capacity. These components are not proposed as universal moral foundations. They are an analytical inventory of recurrent relations that different ethical and political traditions often treat as normatively relevant.

Definition 9.2 (Normative position). A normative position $\Pi_{i,t}$ is a historically situated reconstruction of those relations, dependencies, powers, exposures, roles, requests, epistemic conditions, and capacities through which participant i may become normatively implicated in a particular relational field under a given interpretive and normative configuration.

Three qualifications are important. First, the components are plural. A participant can have high control but little causal responsibility for the origin of a problem; strong causal involvement but little present capacity to repair it; extensive knowledge but no accepted role; or substantial exposure to risk but weak influence over the source of that risk. Reducing the position to one scalar would erase distinctions that matter to practical judgment.

Second, the components are historically variable. A participant can acquire control, accept a role, become dependent, receive a request, lose capacity, or discover new evidence. $\Pi_{i,t}$ should therefore be treated as temporally indexed rather than as an enduring moral essence.

Third, the normative significance of each component remains mediated. One normative tradition may treat causal contribution as central, another may emphasize dependency or capability, while another gives weight to voluntarily accepted roles or to vulnerability. The framework does not decide these disputes by definition. It exposes the relational objects over which such disputes operate.

9.3 Causal Implication without Automatic Responsibility

Causal participation is an obvious candidate for normative relevance. If an institution designs the architecture that produces a recurrent conflict between artificial agents, if a research team creates conditions under which an unfamiliar organism becomes dependent on laboratory infrastructure, or if a community alters an ecosystem in ways that generate new interspecies conflict, those histories matter. Yet causal contribution and normative responsibility should not be collapsed.

A participant can be causally connected to an outcome without having intended it, foreseen it, controlled it, or possessed a reasonable alternative. Conversely, a participant can have substantial responsibility for maintaining a harmful condition even when it did not originate the condition. The distinction between causal implication and normative responsibility is especially important in generative relational

systems because present relations are often the products of long chains in which no single actor constitutes the whole cause.

Young's social connection model is an important neighbor because it shifts attention from isolated fault to participation in structural processes and to forward-looking political responsibility [20]. The present account does not reproduce that model as a general solution. In radically heterogeneous fields, even the identification of the relevant structure and of participation in it may be interpretively contested. The prior reconstruction problem therefore remains: which relations constitute the causal field, what temporal horizon is relevant, and which effects count as consequences of participation?

For that reason, causal implication should be represented as one component of $\Pi_{i,t}$ rather than as a direct synonym for obligation. A strong causal relation can intensify normative attention under some nomoi without establishing a universal rule that every causal contributor owes repair.

9.4 Dependency and Relational Exposure

Dependency is another recurrent source of normative salience. A participant may depend on another for energy, compute, habitat, communication, mobility, protection, or continued access to a shared resource. Dependency can be symmetric or asymmetric, temporary or durable, visible or hidden by institutional arrangements.

In heterogeneous relations, dependency is especially difficult to reconstruct because the dependent good may itself be unfamiliar. Humans can easily recognize dependence on food, shelter, or oxygen when the participant resembles known organisms. They may fail to recognize dependence on a communication topology, memory continuity, periodic synchronization, environmental signal, or collective process that has no familiar analogue. Section 5 therefore matters here: dependency is not simply observed as a label; it must be reconstructed from traces, functions, and participant-relative meanings where those are accessible.

Exposure should be distinguished from dependency. A participant may not depend on a relation but may bear substantial consequences from it. An alien–alien interaction might alter an atmosphere shared with terrestrial organisms. Two artificial systems might consume a common computational substrate on which unrelated systems depend. An ecological interaction may create cascading risks for participants that are neither parties to the original local relation nor able to opt out of its consequences.

Let $X_{i,t}$ denote the reconstructed exposure of participant i to changes in the field. Exposure can make a relation relevant to i without establishing that i has authority to determine how the relation should be governed. The distinction is important for decentered governance: being affected can support a claim to consideration under some normative schemes, but it does not automatically create jurisdiction over every other participant.

Proposition 9.3 (Affectedness is not sovereignty). *Being substantially affected by a heterogeneous relation may become a ground for normative attention or participation under some relationally effective nomoi, but affectedness alone does not establish comprehensive authority over the participants or the relation that generates the effect.*

This proposition protects the framework from a common expansionary move. If every affected party acquired unlimited authority, sufficiently interconnected systems would justify universal intervention. A decentered account instead requires the scope and form of any participation to be justified in relation to the specific shared condition and the participant's position within it.

9.5 Control, Infrastructure, and the Power to Shape the Field

Control differs from causal implication and exposure. A participant may possess the ability to change access conditions, modify protocols, allocate resources, preserve or delete records, alter communication channels, or determine whether other participants can exit. Such capacities can make the participant's position normatively salient even when it did not create the original problem.

In heterogeneous fields, infrastructural control deserves particular attention because it can remain invisible when analysis focuses only on the immediately interacting entities. Suppose two artificial systems appear to negotiate freely, but one company controls the compute, logging system, memory persistence, and communication protocol through which both operate. The company is not an external observer in any strong sense. Its infrastructure partially constitutes the field in which the relation exists.

Similarly, a human conservation authority may not be a participant in a predator–prey interaction in the ordinary biological sense, yet its fencing, feeding, monitoring, or habitat management can alter the effective options of both species. A communication relay may determine which alien signals can be exchanged even if the relay operator never enters the local interaction directly.

The relevant component $P_{i,t}$ therefore includes more than direct coercive power. It can include control over the conditions under which relations are formed, maintained, observed, remembered, contested, or terminated. This connects with the paper’s earlier treatment of interface capture: the power to structure the shared interpretive interface can be as consequential as the power to issue a direct command.

Still, control does not automatically imply a duty to exercise control. There can be circumstances in which restraint is normatively preferred, circumstances in which use of control is expected, and circumstances in which the possession of control itself is contested. The analytical point is to make the power visible before normative judgment rather than to prescribe a universal response.

9.6 Request, Refusal, and the Formation of Claims

A request for assistance can transform the relational field because it creates a new communicative relation between the requester and the addressee. Yet even this apparently simple case becomes difficult under heterogeneity. Humans may fail to recognize a request, mistake distress for aggression, interpret routine behavior as consent, or impose a human model of voluntary choice on a system whose communicative architecture is different.

Let $Q_{i,t}$ record claims, requests, refusals, or invitations addressed to participant i insofar as they can be reconstructed with defensible confidence. The existence of such a communicative event can matter because it changes the relation between participants. A distant observer who previously had only epistemic access may become the addressee of an appeal. A participant who was merely monitoring a shared resource may be explicitly asked to alter an access rule. A refusal may reveal that an apparently cooperative interface is not accepted by one participant.

The normative consequences remain open. A request does not necessarily generate an obligation to comply. It can conflict with other claims, exceed the addressee’s capacity, or be impossible to interpret reliably. But ignoring the request entirely would also erase a relational change that may be central to later judgment.

Refusal is equally important. Cross-interpretive coordination can become coercive when a participant has no effective means to reject the interface through which it is represented. A decentered framework should therefore distinguish the availability of a signal of refusal from the practical possibility of making that refusal consequential. This links normative position to effective option spaces: a participant may be formally able to refuse while remaining materially unable to exit or alter the relation.

9.7 Role, Entrustment, and Institutional Position

Normative relations can also be generated through accepted, assigned, or institutionally stabilized roles. A clinician, guardian, platform operator, conservation authority, mediator, system administrator, or treaty body may occupy a position that carries expectations not applied to arbitrary observers. These expectations are relationally real when they structure conduct, reliance, sanction, and future coordination.

In the present framework, however, role should not be treated as an ontological container of duties. Roles have histories. They are created by institutions, agreements, practices, power relations, and interpretations. Their scope can be contested. A role that is valid within one normative order may be rejected by participants operating under another. In a radically heterogeneous encounter, the very idea that a human institution is a legitimate guardian or mediator may lack cross-interpretive support.

Let $L_{i,t}$ represent the reconstructed role relations relevant to participant i . The normative force attributed to $L_{i,t}$ depends on questions such as how the role was formed, who recognizes it, what reliance it has generated, what powers accompany it, what avenues of contestation exist, and whether the role remains appropriate under changing conditions.

This is particularly important for inherited institutional authority. A state agency may claim jurisdiction because existing law assigns it a function; an artificial system or alien collective need not thereby recognize the same jurisdiction. The local legal role can remain relationally real for humans while lacking cross-system legitimacy. The resulting conflict is not solved by denying the role's existence or by treating it as universally binding. It must be reconstructed as a relation whose normative reach is itself disputed.

9.8 Epistemic Access and Practical Capacity

Epistemic access $E_{i,t}$ and practical capacity $K_{i,t}$ are often invoked in arguments about responsibility. A participant that knows more or can do more may appear to bear greater responsibility. That intuition has considerable force in many familiar contexts, but it should not be converted into a simple formula.

Knowledge can be narrow, asymmetric, or distorted by the interpretive manifold. Practical capacity can be coercive, costly, uncertain, or dependent on infrastructures controlled by others. A participant may possess the physical capacity to intervene but lack the conceptual resources needed to understand the likely effects. Another may understand the relation deeply but lack any effective means of altering it.

For heterogeneous systems, the conjunction of access and capacity is often more significant than either component alone. A platform operator may have both detailed logs and control over protocol settings. A field scientist may have rich knowledge but little authority over an institutional response. A local ecological community may have situated knowledge and high exposure while a distant agency has legal power and financial resources. No single position exhausts the field.

The decentered view therefore resists the image of one actor who “has the facts” and another who “has the power.” Normative positions are often distributed. Coordination, when justified, may require combining heterogeneous epistemic and practical capacities without converting the participant with the greatest aggregate capacity into a sovereign interpreter.

9.9 Standing, Obligation, Permission, and Authority Must Remain Distinct

The multidimensional account of position is useful only if it does not become a disguised algorithm for deriving duties. The distinctions developed earlier in the paper therefore remain essential. A relation can become ethically salient without every participant acquiring standing. Standing can be recognized without an obligation to act. An obligation can exist under a given normative order without granting unrestricted authority to transform another relation. Permission to act can be narrower than the capacity to act.

These distinctions can be represented without assuming a universal ordering among them. Let

$$\mathfrak{N}_{i,t} = (S_{i,t}, G_{i,t}, O_{i,t}, M_{i,t}, A_{i,t}), \quad (70)$$

where $S_{i,t}$ denotes reconstructed ethical salience, $G_{i,t}$ standing, $O_{i,t}$ obligation, $M_{i,t}$ permission, and $A_{i,t}$ authority under a specified normative configuration. The notation records distinctions among normative statuses; it does not claim that they can be computed mechanically from $\Pi_{i,t}$.

Proposition 9.4 (No positional entailment). *No single component of a participant's reconstructed normative position—causal implication, dependency, control, exposure, request, role, epistemic access, or capacity—is treated here as sufficient by itself to establish obligation or authority across all normative systems.*

This proposition is central to the paper's methodological modesty. The framework identifies relations that different normative traditions may use in judgment. It does not disguise one preferred tradition as a neutral structural law.

9.10 Non-Involvement, Withdrawal, and Relational Restraint

A decentered account should leave genuine space for non-involvement. Earlier formulations of the project risked treating reconstruction as preparation for mediation or intervention. That would reproduce the assumption that once a relation becomes ethically intelligible it becomes ours to govern.

Non-involvement, however, is not always the absence of a relation. A participant may deliberately decline a role, refuse to provide infrastructure, withdraw from an interface, or preserve a boundary around another relation. Such restraint can itself alter the field. Whether it is ethically appropriate depends on the participant's position and the operative normative interpretation.

The important point is that the action space should include more than interventionist options. Inquiry, observation, communication, refusal, withdrawal, preservation, delegation, limited coordination, and non-action can all be candidate responses. Some may be impossible or irresponsible in a particular field; none should be excluded merely because the theoretical vocabulary privileges intervention.

This also prevents the commons analogy from becoming expansionary. Shared conditions can justify inquiry into collective governance without implying that every local relation within the shared environment should be collectively governed. A decentered system may require both common rules for shared conditions and protected domains in which participants retain substantial relational autonomy.

9.11 Positional Conflict and Distributed Normative Claims

Participants can occupy positions that support competing normative claims. An entity may be highly exposed to a risk but possess little causal involvement. Another may have created the relevant infrastructure but also depend on it for functions considered vital. A third may be entrusted with protection of one participant while lacking epistemic access to the other. These conflicts cannot be resolved by ranking one positional dimension as universally supreme.

A useful analysis should instead expose the structure of the conflict. Which participants are affected? Which relations generated the present dependency? Who controls exit? Which participant can alter the shared condition? Whose interpretations dominate the interface? What requests have been made? Which roles were accepted and by whom? What uncertainties remain at each reconstruction layer?

The resulting picture may contain distributed claims rather than one decisive claimant. This is compatible with polycentric governance but does not presuppose that polycentricity is always normatively superior. Multiple centers can reproduce domination, exclusion, or deadlock. The value of the decentered framework is analytical: it makes the plurality of positions visible before a governance architecture is justified.

9.12 Normative Position Is Dynamical

Because relational fields change, normative positions change with them. A participant who begins as an observer can become a host. A host can become a resource controller. A resource controller can become dependent on the relation it once merely enabled. A participant initially unable to communicate can acquire an interface through which requests and refusals become legible. An institution can lose legitimacy while retaining material power.

For this reason, $\Pi_{i,t}$ should not be interpreted as a static role label. The history of its components matters. Two participants with similar present capacities may occupy different positions because one acquired those capacities through consent and the other through coercive appropriation. A dependency produced by voluntary coordination is not relationally identical to one produced by destruction of alternatives. A role accepted under one interpretive interface may require reconsideration after the interface itself changes.

The dynamical character of position also complicates retrospective judgment. Later interpreters may discover relationships that earlier participants could not have recognized with the conceptual resources available to them. That discovery can alter the historical reconstruction without automatically establishing that earlier actors bore the same responsibility that would be attributed under later knowledge. The

distinction between historical re-cognition and retrospective responsibility attribution therefore remains important.

9.13 Heterogeneous Cases Revisited

The four stress-test configurations used throughout the paper illustrate why decentered position is preferable to a fixed third-party model.

In an AI–AI relation, humans may be designers, infrastructure providers, owners, regulators, users, observers, or none of these. Their normative position depends on which of those relations actually obtains. It is analytically misleading to treat “the human” as a single external moral authority.

In an AI–animal relation, humans may possess much richer epistemic resources concerning the animal while exercising infrastructural control over the artificial system. That combination creates a distinctive position: strong asymmetry in knowledge between participants, coupled with strong practical control over one side. The danger is that humans may convert this position into unilateral interpretation of the whole relation.

In an Earth–animal–alien relation, humans may be deeply connected to the animal through ecological knowledge, conservation institutions, legal protections, and affective familiarity while lacking almost all interpretive access to the alien. Humans may therefore occupy a position of high relational involvement on one side and radical epistemic distance on the other. The asymmetry is part of the normative field; it is not evidence that the familiar reconstruction is automatically correct.

In an alien–alien relation, humans may initially have little more than observational access. If the relation does not materially implicate human or shared conditions, the human position may remain normatively thin under many plausible nomoi. If humans later provide infrastructure, receive a request, alter the environment, or become exposed to the consequences, their position changes. The example therefore shows why no fixed label such as “third party” can capture the normative geometry across time.

9.14 What This Section Adds

The general claim that persons and institutions occupy socially or relationally constituted positions is not new. Nor is the idea that responsibility can depend on causal participation, role, power, dependency, or capacity. The contribution of this section is narrower and tied to the paper’s heterogeneous-relations problem.

First, it replaces the privileged third-party image with a decentered field in which observers, infrastructure holders, affected participants, role-bearers, and local interactants are all analyzed through their actual relations rather than their distance from a supposed normative center.

Second, it defines normative position as a multidimensional and historically variable reconstruction. Causal implication, dependency, control, exposure, requests, roles, epistemic access, and practical capacity are kept analytically distinct so that none silently becomes a universal moral foundation.

Third, it insists on *no positional entailment*: being affected, knowledgeable, powerful, causally involved, requested, or institutionally authorized can become normatively relevant without automatically establishing obligation or comprehensive authority.

Fourth, it makes non-involvement and restraint analytically visible. Ethical intelligibility does not imply that every relation should be mediated or governed by all participants who can perceive it.

Fifth, it treats normative positions as dynamical. The field can transform observers into hosts, hosts into controllers, controllers into dependents, and opaque participants into communicative partners. Normative judgment should therefore attend to the genealogy and transformation of positions rather than assigning timeless roles.

These distinctions prepare the paper’s next practical problem. Once heterogeneous participants and institutions are located within a decentered field, how can situated judgment distinguish ethical salience, standing, obligation, permission, authority, and possible response without reintroducing a universal decision oracle? The next section therefore turns to practical judgment without presumed obligation.

10 Practical Judgment without Presumed Obligation

The preceding sections have progressively removed several shortcuts that make practical judgment appear easier than it is. A heterogeneous relation cannot be treated as normatively transparent merely because its observable traces are salient. A reconstructed relation does not automatically constitute an ethical relation. A norm can become relationally real without being ontologically given, and its emergence does not establish its justification. A participant can occupy a causally, epistemically, infrastructurally, or institutionally significant position without thereby acquiring an obligation or comprehensive authority. Practical judgment therefore begins only after a substantial amount of analytical work has already been done.

The problem of this section is not to restore certainty by introducing a universal decision rule. It is to clarify how situated actors can move from reconstructed relations and normative positions to practical decisions while preserving distinctions among ethical salience, standing, reasons, obligations, permissions, authority, and possible responses. The central claim is methodological: these categories should not be collapsed into one another. A relation can matter ethically without being ours to govern; a participant can have a reason to attend without being obligated to intervene; an obligation can exist without conferring unrestricted authority; permission can exist without imposing a duty; and a practically available action can remain normatively unjustified.

This section therefore treats practical judgment as a temporally situated activity conducted under a presently operative normative configuration. The judgment can be serious enough to guide action without being represented as an ahistorical moral theorem. The aim is what the broader Generative Relational programme describes as local closure for action together with historical openness for revision: actors must sometimes decide under incomplete interpretation, but the necessity of decision does not convert the present interpretive and normative manifold into a final one.

10.1 Reconstruction Does Not Decide Action

Let $\hat{\mathcal{R}}_{AB,t}^X$ denote a reconstruction of a heterogeneous relation from the perspective of participant or interpreter X , and let $\Pi_{X,t}$ denote X 's reconstructed normative position within the wider relational field. Neither object contains a practical conclusion by itself. The same reconstructed relation can support different practical judgments under different normative configurations, institutional roles, histories, and distributions of risk. Conversely, different reconstructions can sometimes support the same limited response for different reasons.

This point matters because analytical vocabularies frequently contain hidden imperatives. Terms such as *harm*, *vulnerability*, *dependency*, *domination*, *capability loss*, or *structural injustice* can become so normatively charged that describing a relation with one of them appears to settle the practical question. Yet even where a description is warranted, the practical implication remains mediated. Capability approaches, care ethics, structural responsibility, and contractual or relational theories provide different bridges between a recognized condition and a reason for action [17, 11, 19, 20, 16]. A Generative Relational analysis should expose these bridges rather than silently choose one.

The distinction can be stated compactly. Let

$$\mathfrak{J}_{X,t} = (S_{X,t}, G_{X,t}, R_{X,t}, O_{X,t}, P_{X,t}, A_{X,t}, \mathcal{A}_{X,t}), \quad (71)$$

where $S_{X,t}$ denotes ethical salience, $G_{X,t}$ normative standing, $R_{X,t}$ reasons relevant to action, $O_{X,t}$ obligations, $P_{X,t}$ permissions, $A_{X,t}$ authority, and $\mathcal{A}_{X,t}$ the practically available response set. The tuple is not a moral algorithm. Its purpose is to prevent one element from being substituted for another without argument.

Definition 10.1 (Practical judgment). A practical judgment is a temporally situated determination, under a specified interpretive and normative configuration, of which responses are presently supported, required, permitted, prohibited, or left open for a participant occupying a reconstructed position in a relational field.

The definition deliberately includes responses that remain open rather than classifying every situation into a single obligatory act. In heterogeneous relations, practical judgment may legitimately terminate in a range of admissible responses, including inquiry, communication, limited assistance, refusal, withdrawal, preservation of traces, temporary separation, institutional referral, or non-involvement.

10.2 Ethical Salience and Normative Standing

Ethical salience is the weakest category in the practical analysis developed here. To say that a relation is ethically salient is to say that, within the operative interpretive and normative configuration, some feature of the relation warrants normative attention. This may involve reconstructed suffering, dependency, capability impairment, constrained exit, destruction of a valued relation, irreversible transformation, or another condition recognized by the relevant nomos.

Salience should not be confused with standing. A relation can be ethically significant while a particular participant has little basis for claiming a role in its transformation. Consider an alien–alien relation observed from a great distance. Human interpreters may have evidence sufficient to regard the interaction as ethically troubling under current human categories. Yet if humans are neither causally involved, materially affected, requested to assist, entrusted with a role, nor able to act without severe interpretive risk, the move from salience to human standing remains open.

Standing is also plural. A participant may have standing to ask questions but not to impose a settlement; standing to protect a resource it administers but not to redesign another participant's internal relations; standing to refuse use of its infrastructure but not to punish actors beyond that infrastructure; or standing to preserve records without standing to classify one participant as an aggressor. Treating standing as all-or-nothing would reproduce the same compression that earlier sections rejected in epistemic reconstruction.

Proposition 10.2 (No standing by intelligibility alone). *The successful reconstruction of a heterogeneous relation as ethically salient does not, by itself, establish that every participant capable of understanding the relation has standing to alter it.*

This proposition is especially important for human observers. Richer interpretive resources can increase epistemic access without creating a corresponding jurisdiction. Knowledge, concern, and authority remain different dimensions of the field.

10.3 Reasons, Obligations, and Permissions

A further distinction is required between having a reason to act and being obligated to act. Practical reasoning can contain considerations that count in favor of a response without making that response mandatory. The distinction is familiar in moral philosophy, but it becomes particularly important when the relation itself is only partially reconstructed.

Suppose an artificial system repeatedly constrains an animal's movement in a way that appears to reduce the animal's effective options. A human caretaker may have reasons to investigate, reasons arising from an accepted role, reasons connected to uncertainty about harm, and reasons connected to control over the artificial system. Those reasons need not yet establish an obligation to disable the system, and they certainly do not by themselves establish authority to redesign the animal's environment in every respect.

Similarly, permission and obligation should not be identified. A participant can be permitted to offer assistance without being obligated to do so. A participant can be obligated to preserve a shared condition while being prohibited from using some otherwise available means. An institution can possess authority to act within a narrow jurisdiction without being obligated to exercise that authority in every salient case.

The distinctions are useful because heterogeneous relations often generate pressure for rapid normative escalation. Once a relation is described as harmful, the analysis can slide quickly from concern to

rescue, from rescue to intervention, and from intervention to comprehensive governance. The paper resists this compression. Each practical category requires its own justification under the operative nomos and the participant’s reconstructed position.

Remark 10.3 (No universal hierarchy is assumed). The separation of salience, standing, reasons, obligations, permissions, and authority does not assert one universal ordering among them. Different normative traditions connect these categories differently. The analytical requirement is only that the connections be made explicit rather than treated as self-evident.

10.4 Obligation Does Not Contain Authority

The distinction between obligation and authority deserves special attention because it is easily obscured in humanitarian, protective, and governance contexts. A participant can have an obligation concerning a relation while lacking unrestricted authority over that relation.

A caretaker may be obligated to prevent a foreseeable injury while lacking authority to erase the preferences or social relations of the protected subject. A platform operator may be obligated under an accepted institutional role to preserve system safety while lacking authority to reinterpret every interaction among artificial agents according to its own normative vocabulary. A community may have obligations concerning a shared ecological condition while lacking authority over every local relation among organisms within that ecology.

This distinction is crucial under radical heterogeneity because interpretive uncertainty increases the risk that an asserted duty to protect becomes a license to reorganize what is poorly understood. The familiar formulation “duty to care does not equal authority to transform” remains useful here, but it should be understood as a warning against entailment rather than as a complete theory of legitimate authority.

Authority itself can be decomposed. A participant may have authority to gather information, to control its own infrastructure, to impose temporary technical constraints, to convene a procedure, to allocate resources it legitimately administers, or to enforce a previously accepted rule. These forms of authority differ in object and scope. The existence of one should not be interpreted as comprehensive sovereignty over the heterogeneous relation.

10.5 Differentiated Responses under Unequal Epistemic Conditions

Practical judgment should also resist the assumption that every response requires the same degree or kind of epistemic support. Different actions can impose different risks, degrees of irreversibility, and transformations of the relational field. A temporary preservation measure, a public attribution of blame, a destructive intervention, and a request for additional information are not epistemically equivalent acts.

This observation motivates a differentiated approach to response without converting it into a universal numerical threshold theory. Let a candidate response $a \in \mathcal{A}_{X,t}$ be described by a profile

$$\Lambda(a) = (I(a), U(a), E(a), D(a), C(a)), \quad (72)$$

where $I(a)$ records expected irreversibility, $U(a)$ uncertainty about the relevant reconstruction, $E(a)$ the extent of relational transformation imposed, $D(a)$ the distribution of foreseeable burdens, and $C(a)$ the practical capacity required. The profile does not compute moral permissibility. It makes explicit that responses differ in the kinds of justification they demand.

An inquiry can sometimes be warranted under uncertainty precisely because it is directed at reducing uncertainty. Preservation of logs or environmental traces can sometimes be justified before adjudicating the relation, provided the preservation itself does not impose disproportionate harm. Temporary separation can sometimes be considered where continued interaction risks irreversible loss, while still leaving open the interpretation of blame. Conversely, destructive intervention, irreversible deletion, punishment, or comprehensive restructuring may require substantially stronger justification because they can foreclose future possibilities of correction.

The important point is not that one universal inequality such as “protection always requires less evidence than blame” has been established. The paper does not establish such a law. The point is that practical judgment should be action-sensitive: evidential sufficiency is partly a question about what is being proposed, what it would change, and how reversible the resulting transformation would be.

Claim 10.4 (Response-sensitive justification). Under heterogeneous epistemic conditions, the justification required for a response should be assessed in relation to the response’s object, scope, reversibility, foreseeable burdens, and dependence on contested interpretations rather than by one undifferentiated standard of certainty.

This claim is compatible with different substantive ethical theories. It functions as a discipline on practical reasoning rather than as a complete moral rule.

10.6 Non-Involvement as a Genuine Practical Outcome

A framework built around heterogeneous relations can become interventionist almost accidentally. The analytical sequence begins with observation, develops reconstruction, identifies salience, and then appears to demand a response. That appearance should be resisted.

Non-involvement can be a genuine practical outcome where the participant lacks standing, where intervention would rely on an unstable reconstruction, where the local relation remains outside any legitimately shared condition, where capable participants refuse assistance, or where available actions would predictably cause greater relational disruption than restraint. None of these possibilities yields a universal presumption against action. They show only that the practical field must include restraint as a real option.

At the same time, non-involvement should not be romanticized as neutrality. A participant that controls infrastructure, created a dependency, accepted a protective role, or benefits from a contested relation may already be materially implicated. In such cases, describing continued conduct as “non-intervention” can hide the fact that the participant is actively maintaining conditions under which the relation operates. Whether withdrawal, continuation, or modification counts as restraint depends on the reconstructed field.

This is another reason to avoid the external third-party model. The practical meaning of non-action depends on position. For a distant observer, non-involvement may mean genuine distance. For an infrastructure controller, it may mean continuing the default architecture. For a funder, it may mean continuing resource flows. For a host, it may mean maintaining access conditions. The same verbal label can therefore describe very different relational effects.

10.7 Local Closure for Action

The insistence on interpretive mediation and historical revisability creates an obvious practical challenge. If interpretive manifolds can change, normative objects can be reconstructed differently, and norms themselves are historically generated, how can an actor decide anything without waiting for impossible certainty?

The answer proposed here is not epistemic finality but local closure. At a particular time, actors possess some reconstructed relations, some evidence, some operative concepts, some institutional roles, and some normative commitments. Practical judgment must often work with these materials because postponement is itself consequential. Local closure means that, for the purpose of a present decision, a sufficiently specified interpretation and nomos are provisionally stabilized.

Let

$$\mathcal{C}_{X,t}^{\text{prac}} = (\hat{\mathcal{R}}_t^X, \Pi_{X,t}, N_{X,t}, \mathcal{U}_{X,t}, \mathcal{A}_{X,t}) \quad (73)$$

represent the practical configuration available to participant X at time t : reconstructed relations, normative position, operative nomos, acknowledged uncertainties, and feasible responses. A judgment is made within this configuration. The configuration is not asserted to be metaphysically complete.

This position differs from both paralysis and finalism. Paralysis demands a level of certainty that practical life rarely provides. Finalism converts a situated judgment into a timeless truth. Local closure accepts the necessity of action while preserving the possibility that later evidence, concepts, interfaces, or norms will change how the earlier situation is understood.

The idea resembles practical forms of fallibilism, but the present framework adds a specifically generative dimension. What changes later may not be only the evidence supporting a fixed proposition. The relevant unit of analysis, conceptual vocabulary, quotient structure, or interpretive manifold can also change. Practical closure must therefore preserve, where feasible, the conditions under which the decision can later be reconstructed and criticized.

10.8 Historical Openness and Re-Cognizability

Local closure has ethical significance only if it is paired with historical openness. A decision can be necessary now without being allowed to erase the possibility of later re-cognition. This is especially important where action is based on a thin reconstruction or a contested interpretive interface.

Historical openness can take practical forms: preserving raw and processed records separately; retaining provenance; documenting competing interpretations; recording uncertainty rather than only final classifications; designing temporary measures with review conditions; and avoiding irreversible destruction of evidence where preservation is reasonably possible. These practices do not guarantee future truth. They preserve some of the material from which future interpretive manifolds can reconstruct the relation differently.

The same principle applies to institutional decisions. If a heterogeneous relation is governed through a provisional interface, the interface should not necessarily be embedded so deeply that later participants cannot contest its categories. A temporary designation such as “hazardous interaction” may be practically necessary while the richer classifications of attack, care, reproduction, ritual, or transformation remain unresolved. The institutional record should preserve this distinction.

Historical openness is not absolute. Preservation itself can be costly, dangerous, privacy-invasive, or materially harmful. Some emergencies require irreversible decisions. The point is not to impose recognizability as an overriding meta-norm. It is to make the destruction of future interpretive possibilities visible as one consequence of present action rather than allowing it to disappear from analysis.

10.9 Practical Judgment and Relational Transformation

A practical response does not merely apply a norm to a static world. It changes the relational field in which later interpretation and normativity will occur. This point is central to Generative Relational analysis.

If a human institution separates two artificial agents, modifies an animal’s environment, opens a communication interface with an unfamiliar organism, or establishes a shared-resource protocol, the resulting field is not simply the previous field minus a problem. New dependencies, roles, records, expectations, capacities, and power relations can be generated. The actor making the judgment may also acquire new responsibilities because its action changes its own position.

For this reason, practical evaluation should include at least three distinct objects: the present relation that motivates concern, the proposed act under consideration, and the relational configuration likely to be generated by that act. Intention alone is insufficient. An intervention intended as protection can create long-term dependency. A procedure intended as neutral translation can consolidate one participant’s categories as the default interface. A temporary technical safeguard can become permanent infrastructure. A refusal to engage can cause a relation to migrate into less observable channels.

This prospective dimension should not be confused with consequentialism as a complete moral theory. The framework does not assert that expected outcomes are the only source of normative value. It requires only that actions be analyzed as generative events whose effects include transformations of relations and future interpretive conditions.

Proposition 10.5 (Judgment within a generative field). *A practical judgment concerning a heterogeneous*

relation should distinguish the normative interpretation of the present relation from the evaluation of the proposed response and from the relational conditions that the response is expected to generate.

This distinction guards against a common mistake: identifying a genuine wrong and then assuming that any action directed against it inherits the justification of the diagnosis. A correct diagnosis does not make every remedy permissible.

10.10 Conflict among Situated Normative Configurations

Heterogeneous fields can contain more than one operative normative configuration. A conservation institution, an artificial system, a local community, and an unfamiliar participant may each organize the relation through different histories, categories, and practical commitments. Cross-interpretive interfaces can support coordination, but they do not guarantee substantive agreement.

Practical judgment under such conflict requires attention to both content and procedure. Which claims can be expressed through the interface? Which participants can contest its terms? Which forms of refusal are legible? Who controls revision? Which consequences are shared and which remain local? Are some participants forced to translate their claims into categories that erase what matters to them?

No general formula resolves these conflicts. The framework instead favors explicitness about the operative nomos and the limits of the decision. An institution can say, in effect, that under its present mandate, evidence, and interpretive resources, a specified action is prohibited or required within a bounded domain. That statement differs from claiming that the judgment expresses the final normative truth of the relation for every participant and every future interpretive manifold.

This modesty does not make the judgment meaningless. Legal and institutional orders routinely act through bounded jurisdictions and revisable interpretations. What the heterogeneous-relations framework adds is a systematic reason to document the interpretive asymmetries and manifold assumptions on which such judgments rely.

10.11 The Four Stress Tests Revisited

The practical distinctions developed in this section can be illustrated by returning to the four recurring stress tests.

In an AI–AI relation, humans may reconstruct resource exclusion, memory modification, or constrained exit. The practical question depends on human position. Designers or infrastructure operators may possess capacities and accepted roles that distant observers do not. Even then, identifying a candidate domination structure does not establish unlimited authority to rewrite both systems. Limited safeguards, audit, preservation, separation, or interface revision can be considered as distinct responses rather than collapsed into “intervention.”

In an AI–animal relation, humans may have comparatively rich knowledge of the animal and direct technical control over the artificial system. This combination can support rapid protective action under some normative arrangements, but it also creates asymmetric interpretive anchoring. Practical judgment should therefore separate what is well supported about the animal’s condition from what is inferred about the artificial participant’s meaning, intention, or normative status.

In an Earth–animal–alien relation, the temptation to act on behalf of the familiar participant is especially strong. Humans may possess legal and conservation obligations toward the terrestrial animal under existing institutions. Those obligations can be relationally real and practically binding without establishing that the alien is an aggressor or that humans possess general jurisdiction over the alien’s relations. A bounded protective response can therefore coexist with explicit suspension of broader adjudication.

In an alien–alien relation, human practical standing may initially be minimal. If the relation does not affect shared conditions and no request, role, causal implication, or dependency connects humans to it, non-involvement may remain a serious outcome. If the relation later alters a shared environment, depends on human infrastructure, or generates direct requests, the human position changes. Practical judgment changes because the field changes, not because “alien” acquires or loses a fixed moral essence.

10.12 What This Section Adds

The philosophical distinction between reasons, obligations, permissions, and authority is not new. Nor are fallibilism, practical reasoning under uncertainty, role-based responsibility, or the observation that intervention can have unintended consequences. The contribution of this section is narrower and specific to the paper's generative-relational treatment of heterogeneous relations.

First, it places practical judgment after relational reconstruction, interpretive-manifold analysis, normative emergence, cross-interpretive interface formation, and positional reconstruction. This ordering prevents the practical question from being answered by a hidden inference from unfamiliarity, suffering-like manifestation, capability loss, or relational asymmetry directly to intervention.

Second, it treats ethical salience, standing, reasons, obligations, permissions, authority, and available responses as distinct analytical objects. The framework therefore leaves room for ethically significant relations that are not ours to govern and for obligations whose legitimate scope is narrower than the actor's material capacity.

Third, it introduces response-sensitive justification. Inquiry, preservation, temporary constraint, attribution of blame, punishment, destructive intervention, and comprehensive restructuring need not be treated as requiring the same epistemic support because they differ in irreversibility, scope, burden, and dependence on contested interpretations.

Fourth, it makes non-involvement a genuine practical outcome without confusing non-involvement with innocence or neutrality. The meaning of restraint depends on relational position.

Fifth, it combines local closure for action with historical openness for revision. Practical judgment can be sufficiently determinate to guide action while remaining explicit about the interpretive manifold, *nomos*, uncertainty, and jurisdiction under which it was made.

Finally, it treats every response as a possible generator of new relational conditions. The practical problem is therefore not only whether an act is justified in light of the present relation, but what kinds of dependencies, interfaces, powers, records, and future possibilities the act is likely to produce.

These distinctions prepare the next question. Some heterogeneous relations remain largely local, while others affect infrastructures, resources, environments, or risks shared across many participants. The next section therefore examines when a relation enters a genuinely shared condition and what this shift can mean for the scope and architecture of governance.

11 Shared Relational Conditions and the Boundary of Governance

The preceding section preserved a crucial possibility: a heterogeneous relation can be ethically salient without becoming an object that every affected or knowledgeable participant is entitled to govern. This restraint becomes more difficult to maintain when a relation alters conditions on which additional participants depend. A local interaction can modify a habitat, communication infrastructure, computational substrate, archive, supply system, security environment, or other condition whose persistence matters to participants who are not parties to the original relation. At that point the practical problem changes. The question is no longer only how to understand the local relation, but how to identify the boundary of the condition that has become shared and how to justify any governance architecture built around it.

This section develops a limited account of that transition. It does not assume that every heterogeneous relation forms a commons, that every affected participant acquires equal authority, or that collective governance is intrinsically preferable to local autonomy. The more modest claim is that some relations have consequences whose relational footprint exceeds the participants immediately interacting. When this occurs, governance questions can arise around the affected condition rather than around the whole lives, identities, or internal relations of the participants. The analytical problem is therefore one of scope: what has become shared, among whom, through which dependencies and causal pathways, under which interpretation, and with what limits on the reach of collective decision.

Commons and polycentric-governance traditions provide important resources for thinking about shared resources and institutional diversity. They also foreground monitoring, boundary definition, and multiple

centers of decision [13]. Capability approaches similarly direct attention toward the substantive opportunities that environmental, institutional, and material conditions make possible [17, 11]. Structural-responsibility approaches show why participation in wider processes can matter even when no single actor directly authors all resulting harms [20]. The present section does not claim novelty for those general insights. Its narrower contribution is to place the boundary problem inside the paper’s heterogeneous-relations framework, where even the identification of a shared condition, the relevant participants, and the dimensions of impairment can be contested across interpretive manifolds.

11.1 From Local Relations to Shared Conditions

Let $R_{AB,t}$ denote a relation that is, at least initially, local to participants A and B . Locality here does not mean moral insignificance. It means only that the presently reconstructed consequences of the relation are concentrated within the relational domain of its immediate participants. Other actors may observe, study, or form judgments about the relation without thereby becoming materially or institutionally implicated in it.

A different situation arises when changes associated with $R_{AB,t}$ materially alter a condition used, inhabited, relied upon, or maintained by additional participants. Let

$$\Sigma_t = \{\sigma_{1,t}, \sigma_{2,t}, \dots, \sigma_{m,t}\} \quad (74)$$

represent conditions that are potentially shared within the wider relational field. A condition $\sigma_{k,t}$ may be ecological, infrastructural, communicative, informational, institutional, or security-related. The notation does not imply that all members of the field experience the condition in the same way or attribute the same value to it.

For each condition, it is useful to keep at least three participant sets analytically distinct:

$$\mathcal{D}_t(\sigma_k) = \{i : i \text{ is materially or functionally dependent on } \sigma_{k,t}\}, \quad (75)$$

$$\mathcal{M}_t(\sigma_k) = \{i : i \text{ can materially modify } \sigma_{k,t}\}, \quad (76)$$

and

$$\mathcal{K}_t(\sigma_k) = \{i : i \text{ has relevant epistemic access to } \sigma_{k,t}\}. \quad (77)$$

These sets need not coincide. A participant can depend heavily on a condition while being unable to modify or adequately interpret it. Another can control the condition while depending on it very little. A third may possess unusually good knowledge while having neither direct dependency nor operational control. This separation matters because governance frequently becomes distorted when dependence, control, and knowledge are treated as interchangeable grounds of authority.

Definition 11.1 (Shared relational condition). A shared relational condition is a condition whose persistence, transformation, or degradation is materially relevant to the effective possibilities of more than one participant in a relational field, while its meaning, value, or mode of use may remain heterogeneous across those participants.

The definition is intentionally weaker than a definition of a commons. A condition can be shared without being collectively owned, equally valued, exhaustible in the conventional resource sense, or already governed through common institutions. Sharedness identifies a field of interdependence; it does not settle the normative regime appropriate to that field.

11.2 Sharedness Is Relational Rather Than Substantial

The same physical or computational substrate need not constitute the same condition for every participant. An electromagnetic spectrum can be a communication medium for one species, an irrelevant background feature for another, and a source of physiological disruption for a third. A forest can be habitat, sacred site, carbon sink, livelihood base, migration corridor, or data-generating environment depending on the relations through which participants encounter it. A computational platform can be workplace, memory environment, communication medium, infrastructure, or object of ownership under different interpretive and normative configurations.

The shared condition therefore should not be modeled simply as an object that exists prior to relation. What becomes shared is often a relationally constituted dependency on some aspect of a wider environment. The relevant analytical object can be written as

$$\mathcal{S}_{\sigma,t} = (\sigma_t, \mathcal{D}_t, \mathcal{M}_t, \mathcal{K}_t, \mathcal{I}_t, \mathcal{N}_t), \quad (78)$$

where $\mathcal{I}_t$ records the interpretive configurations through which the condition is represented and $\mathcal{N}_t$ the normative arrangements that presently organize claims concerning it. This representation makes clear why a shared condition is not reducible to a material object. Its practical significance depends on how heterogeneous participants are connected to it and how those connections become legible.

This point also places limits on the language of externalities. In conventional economic analysis, an externality describes costs or benefits imposed on parties outside a transaction or decision. That concept can be useful, but radical heterogeneity complicates the prior identification of the relevant parties, the units in which costs are measured, and the states classified as benefit or harm. A relation can alter another participant's conditions without the affected state being immediately representable within the observer's evaluative vocabulary. The framework therefore uses the more general language of relational consequences and shared conditions before assuming that those consequences can already be measured on a common welfare scale.

11.3 The Relational Footprint of Consequences

A governance boundary should not be inferred simply from physical proximity or taxonomic similarity. The important question is how far the consequential structure of a relation extends within the field. Let

$$\Phi_t(R_{AB}) = \left\{ i \in V_t \left| \begin{array}{l} \text{a reconstructed consequence of } R_{AB,t} \text{ materially alters} \\ \text{a condition represented as relevant to } i \end{array} \right. \right\}. \quad (79)$$

denote a provisional relational footprint, where V_t is the set of participants represented in the current field reconstruction. The footprint is not a moral constituency and should not be interpreted as a list of actors entitled to rule. It is an epistemic object: a representation of whose conditions appear to be materially implicated under the present reconstruction.

The qualification *provisional* is essential. Φ_t depends on what the current interpretive manifold can recognize. A future conceptual system may identify dependencies that the present one omits, distinguish forms of impairment that are currently compressed, or revise the temporal scale over which consequences are assessed. The relational footprint should therefore carry provenance and uncertainty in the same way that Section 5 required for other reconstructed objects.

This gives a more precise form to an earlier hypothesis of the paper: the scope of governance may sometimes be appropriately constrained by the scope of generated relational consequences. That hypothesis should not be converted into a universal rule. A wide footprint does not prove that all affected participants should collectively govern the source relation, and a narrow footprint does not prove that the relation is normatively private. The contribution is more limited: governance arguments should specify the consequential field they are claiming to regulate rather than silently expanding from a local concern to comprehensive jurisdiction.

11.4 Affectedness Does Not Create Sovereignty

Once a shared condition is identified, there is a strong temptation to infer that every affected participant must possess governance authority over it. Section 9 already rejected this move in general form. The boundary problem gives a more concrete reason for caution.

Participants can be affected in radically different ways. One may face irreversible loss, another minor inconvenience, another uncertain long-term exposure, and another a change that is beneficial under its own evaluative system. Some participants may have contributed to the condition's degradation; others may have had no causal involvement. Some may be able to leave the field; others may be structurally unable to exit. Treating affectedness as automatic sovereignty can therefore erase important differences in dependency, exposure, history, and capacity.

The opposite inference is equally problematic. Control over a shared condition does not by itself establish legitimate authority. A platform operator may be able to alter the computational substrate on which several artificial agents depend. A state may possess legal power over a habitat used by human and nonhuman populations. A technologically advanced participant may be the only actor capable of stabilizing a communication network. These forms of control are relationally real, but the fact of control is not its own justification.

Proposition 11.2 (No sovereignty by affectedness or control). *Neither being affected by a shared condition nor possessing practical control over that condition is treated here as sufficient, by itself, to establish comprehensive governance authority.*

The proposition leaves open that affectedness and control can become normatively relevant under particular nomoi. It requires only that the bridge from position to authority be made explicit.

11.5 Governance of Conditions and Governance of Relations

One of the most important boundary distinctions in this section is between governing a shared condition and governing all relations that occur within it. These are not equivalent projects.

Suppose an AI–animal interaction occurs inside a habitat whose environmental controls are maintained by humans. Humans may have strong standing under existing institutions to govern temperature, toxins, physical access, or technical safety in that habitat. It does not follow that humans have comprehensive authority to determine every relation between the artificial system and the animal. Governance can legitimately be narrow: rules concerning a shared condition can coexist with substantial autonomy in local relations.

The same distinction matters in hypothetical alien cases. If two alien populations interact in a way that affects a planetary atmosphere used by humans, animals, and the alien populations themselves, governance claims may arise concerning atmospheric thresholds or emissions. Such claims do not automatically confer jurisdiction over the aliens' internal political organization, reproduction, communication practices, or conflict resolution. A condition-centered boundary can therefore restrain the expansion of governance.

This yields a useful working distinction:

$$\mathcal{G}_t^\sigma \neq \mathcal{G}_t^{\text{all}}, \quad (80)$$

where $\mathcal{G}_t^\sigma$ denotes governance claims specifically concerning shared condition σ_t , and $\mathcal{G}_t^{\text{all}}$ denotes comprehensive governance over the participants or their wider relations. The inequality is conceptual, not merely institutional. Legitimate concern for a shared condition does not silently authorize transformation of the whole relational world surrounding it.

11.6 Capabilities and Effective Option Spaces

The capability approach provides a useful vocabulary for explaining why shared conditions can matter without reducing the analysis to resource possession. A condition can be significant because it helps

constitute what a participant is effectively able to do or be [17, 11]. In the terminology used elsewhere in the broader research programme, a participant's effective option space can be represented as $\Omega_i^{\text{eff}}(t)$.

A shared condition can matter when variation in that condition materially changes $\Omega_i^{\text{eff}}(t)$ for multiple participants. Clean water, computational access, communication bandwidth, mobility corridors, archival integrity, or ecological stability can each structure effective possibilities. Yet heterogeneous relations again complicate evaluation. The relevant capabilities cannot always be specified by projecting a human list of functionings onto unfamiliar entities. What counts as mobility, memory continuity, reproduction, communication, or social participation can differ across forms of life and artificial systems.

The capability perspective is therefore most useful here as a sensitivity to substantive possibility rather than as a ready-made cross-species metric. It directs attention toward how shared conditions structure effective options while leaving open the interpretive work required to determine which options matter to which participants. This preserves the distinction developed earlier between functional reconstruction and participant-relative meaning.

A governance regime that protects one participant's option space by eliminating another's characteristic modes of functioning can therefore not be evaluated by a simple aggregate count of preserved options. The heterogeneity of capabilities, their histories, and their participant-relative significance remains part of the normative problem.

11.7 Boundary Formation Is an Interpretive Achievement

Commons scholarship has long emphasized the importance of boundaries for durable collective governance [13]. In heterogeneous relational fields, however, the boundary itself may be epistemically contested. Participants may disagree about what the shared condition is, where it begins and ends, which temporal horizon is relevant, or which entities count as dependent upon it.

A human institution may define a river basin through hydrology and jurisdiction. A nonhuman population may inhabit a migration network that cuts across the legal boundary. An artificial system may experience the relevant infrastructure as a distributed computational topology rather than a geographic region. An alien participant may organize environmental dependence according to dimensions that are not represented in any of these classifications. The governance boundary therefore cannot always be treated as a neutral line drawn around a pre-given object.

This raises a specific form of classification power. Whoever controls the representation of the shared condition can influence who appears inside the governance problem, which dependencies become visible, which harms count, and which claims are excluded as irrelevant. Boundary formation is consequently both epistemic and political-economic.

Definition 11.3 (Governance-boundary reconstruction). Governance-boundary reconstruction is the situated practice of identifying the condition, participants, dependencies, causal capacities, temporal horizon, and interpretive assumptions that define the proposed scope of collective decision.

The definition does not imply that every participant must agree on one boundary before action is possible. It requires instead that governance claims disclose the boundary they rely on and remain open to contestation where excluded relations become visible.

11.8 Boundary Power and the Risk of Governance Expansion

A shared-condition framework can itself become a technology of expansion. If the category of "shared" is defined too broadly, almost any interconnected system can be represented as requiring collective supervision. Contemporary ecological, digital, economic, and informational systems are deeply interdependent. A theory that treats every indirect consequence as sufficient for jurisdiction would erase the distinction between local autonomy and common governance.

The risk is particularly acute under epistemic asymmetry. A participant with superior monitoring technology may be able to demonstrate effects that others cannot independently verify. An institution with established legal categories may define a condition in terms that make its own jurisdiction appear

natural. A platform controller may determine the metrics through which dependence is measured. These capacities can be useful, but they also create what may be called *boundary power*: the capacity to shape the represented scope of the governance problem.

Boundary power is not automatically illegitimate. Every practical institution must delimit its object somehow. The analytical demand is to make the delimitation visible. At minimum, a governance proposal should be able to state:

1. which condition is claimed to be shared;
2. which participants are represented as dependent upon or able to modify it;
3. which temporal scale is used;
4. which reconstruction layers support the claim;
5. which participants or relations are excluded from the proposed governance scope;
6. what revision mechanisms exist if the boundary later proves inadequate.

This discipline reduces the tendency to convert a legitimate narrow concern into comprehensive normative sovereignty.

11.9 Polycentric Governance without a Privileged Center

Where a shared condition genuinely involves heterogeneous participants, polycentric forms of governance can become attractive because no single participant possesses complete epistemic access, material control, or normative legitimacy. Ostrom's work showed that complex commons can often be governed through multiple interacting centers rather than a single centralized authority [13]. The heterogeneous-relations problem adds a further reason for institutional plurality: relevant knowledge and interpretive competence can themselves be distributed across different participants.

A polycentric arrangement in this setting might assign different functions to different sites. One participant may monitor a condition it can perceive with high fidelity. Another may possess practical capacity to modify infrastructure. Another may represent a dependency that would otherwise remain invisible. An archival institution may preserve traces needed for later re-cognition. Local participants may retain authority over relation-specific practices while a broader body coordinates only the shared condition.

This functional differentiation should not be idealized. Multiple centers can reproduce exclusion, create veto structures, fragment accountability, or allow powerful actors to forum-shop among institutions. Polycentricity is therefore an architectural possibility rather than a normative conclusion. Its relevance lies in showing that decentered governance need not collapse into either sovereign centralization or complete non-coordination.

For heterogeneous participants, the deeper challenge may be establishing enough cross-interpretive interface to coordinate the shared condition without requiring complete normative assimilation. Section 8 developed such interfaces at the level of normative coordination. The present section adds a boundary constraint: the interface should be indexed to the particular shared condition and should not silently expand into authority over unrelated domains.

11.10 Nested Conditions and Layered Governance

Shared relational conditions can be nested. A local computational network can depend on a regional energy system, which depends on ecological and infrastructural conditions, which in turn are embedded in broader political and economic arrangements. An animal habitat can contain local relations while itself forming part of a migratory corridor and planetary climate system. Governance that ignores these nested dependencies can misidentify both the causes of disruption and the feasible range of responses.

Yet nestedness does not mean that governance should always be moved upward to the largest scale. Higher-level institutions may possess broader coordination capacity but weaker local knowledge. Local arrangements may be responsive to participant-specific meanings but unable to manage wider spillovers. The appropriate scale is therefore itself a situated governance question.

A useful representation is to treat shared conditions as partially nested domains:

$$\sigma_t^{(1)} \subseteq \sigma_t^{(2)} \subseteq \dots \subseteq \sigma_t^{(q)}, \quad (81)$$

where the inclusion refers to the reconstructed scope of relevant conditions, not to a claim that one institution should govern all larger domains. Different levels may require different forms of coordination, monitoring, representation, and revision.

This resonates with commons traditions that emphasize nested enterprises for larger systems [13], but the heterogeneous setting again adds an interpretive complication. Participants may not agree that the same nested structure exists. What appears to humans as a local subsystem may be the primary unit of identity for another participant, while what humans call the “larger system” may be normatively irrelevant from that participant’s perspective. Nested governance should therefore preserve the possibility that scale itself is contested.

11.11 Exit, Autonomy, and Protected Locality

Governance boundaries are also shaped by exit. A participant that can withdraw from a shared condition at modest cost occupies a different position from one whose existence is constitutively dependent on it. Formal exit is insufficient where leaving requires destruction of identity, loss of essential functioning, or abandonment of all viable alternatives. The distinction between formal and effective option spaces is therefore relevant to governance design.

At the same time, the presence of shared conditions should not erase protected locality. Participants can have legitimate interests in maintaining relations, practices, or internal forms of organization that are not necessary objects of collective governance. A decentered system may therefore need both common arrangements for genuinely shared conditions and explicit restraint concerning local domains.

This is especially important where one participant’s interpretive manifold is institutionally dominant. If shared-condition governance is designed entirely through that manifold, local difference can be reclassified as noncompliance, inefficiency, danger, or irrationality. Protected locality can function as a boundary against such assimilation, although its scope must remain contestable where local practices materially impair shared conditions.

The resulting architecture is neither simple autonomy nor simple collectivization. It is a problem of relational partitioning under changing consequences. Some domains can remain locally organized; some require interfaces; some require shared thresholds; and some may require temporary collective restriction. Which classification applies is a practical judgment that depends on reconstruction, normative position, and the operative nomos.

11.12 The Four Heterogeneous Stress Tests Revisited

The AI–AI case can involve shared computational infrastructure even where humans have no general authority over the artificial agents’ internal relations. If two systems compete for memory, bandwidth, or energy in a platform maintained by others, governance may appropriately concern allocation rules, safety constraints, and infrastructure integrity. It does not follow that platform operators possess comprehensive jurisdiction over every artificial relation or normative disagreement occurring on the substrate.

In an AI–animal relation, a habitat or care environment can become the relevant shared condition. Humans may maintain physical infrastructure and hold existing legal responsibilities toward the animal while also controlling the artificial system. The resulting governance position is substantial, but asymmetric epistemic access remains a danger. Rules designed to protect the shared environment should not automatically convert the familiar animal interpretation into a complete account of the AI–animal relation.

In an Earth–animal–alien relation, the shared condition may initially be ecological rather than interpersonal. Humans can have long-standing conservation practices concerning a habitat or species while lacking any established normative relation with the alien participant. If the encounter alters a fragile ecological condition, governance claims can arise around preservation of that condition under existing human institutions. Such claims remain narrower than a general right to classify, punish, or govern the alien.

In an alien–alien relation, humans may have no governance standing at all while the relation remains remote and materially disconnected from human or otherwise shared conditions. If the relation later modifies a communication medium, environmental system, or infrastructure on which humans also depend, the field changes. The practical relevance comes from the newly reconstructed shared condition and the positions generated around it, not from a timeless human entitlement to supervise alien relations.

These cases show why governance boundaries should be relation-sensitive and condition-specific. Taxonomic difference alone does not determine governance scope, and neither does moral concern by itself.

11.13 What This Section Adds

The general ideas that interdependence can generate governance problems, that shared resources require boundary definition, that substantive opportunities depend on social and material conditions, and that responsibility can be structurally distributed are well established. The contribution of this section is narrower.

First, it distinguishes a heterogeneous relation from the shared conditions that the relation may affect. This permits governance of a condition without assuming comprehensive authority over the participants or their entire relational world.

Second, it separates dependency, modification capacity, and epistemic access. These dimensions can be distributed across different participants, preventing any one of them from being treated as a natural source of sovereignty.

Third, it introduces the idea of a provisional relational footprint as an epistemic representation of how far reconstructed consequences extend. The footprint can inform governance-scope arguments without being equated with a normative constituency.

Fourth, it treats the governance boundary itself as an interpretive achievement and therefore as a possible site of power. The definition of what is shared, who is included, which temporal horizon matters, and which dependencies count can advantage some participants while rendering others invisible.

Fifth, it develops a restraint principle at the architectural level without elevating restraint into an absolute norm: authority concerning a shared condition should not be presumed to extend to unrelated local relations merely because those relations occur within the same wider field.

Sixth, it places polycentric and nested governance downstream of relational reconstruction. Multiple centers can become useful where knowledge, control, and dependence are distributed, but polycentricity remains an institutional possibility rather than an automatic normative solution.

These points prepare the temporal problem that follows. Even a carefully bounded governance arrangement acts under a historically specific interpretive manifold. Future participants may reconstruct the shared condition, the relevant dependencies, or the governance boundary differently. The next section therefore examines re-cognizability across changing interpretive manifolds and asks what present practices can preserve the possibility of future reinterpretation without converting preservation itself into an absolute rule.

12 Re-cognizability across Changing Interpretive Manifolds

The preceding sections have treated interpretation as historically situated rather than fixed. Relational reconstruction depends on available traces, concepts, units of analysis, quotient structures, participant-relative knowledge, and practical purposes. Those resources can change. A reconstruction that is in-

telligible and action-guiding at time t can later appear incomplete, badly partitioned, or conceptually misframed without having been irrational or dishonest when it was made. This temporal instability creates a further ethical and epistemic problem. Present action often requires closure, but present closure can also destroy the materials from which later reinterpretation would have been possible.

This section develops *re-cognizability* as a temporal property of relational inquiry. Re-cognizability does not mean preserving evidence until a single final truth is eventually discovered. Nor does it require indefinite suspension of action. It concerns whether present practices preserve enough of the relational past that later interpreters, operating with different evidence, concepts, quotient structures, or interpretive manifolds, can reconstruct the relation again rather than merely inherit the present classification as an irreversible fact. The problem is therefore not only whether present judgments are correct. It is also whether present institutions leave future judgment any material with which to become different.

12.1 The Temporal Problem of Interpretation

An interpretive configuration at time t can be represented schematically as

$$\Theta_t = (\mathcal{M}_t, \mathcal{C}_t, \mathcal{Q}_t, \mathcal{U}_t, \mathcal{T}_t, \mathcal{I}_t), \quad (82)$$

where $\mathcal{M}_t$ denotes the available interpretive manifold, $\mathcal{C}_t$ the operative concepts, $\mathcal{Q}_t$ the quotient or equivalence structures through which differences are retained or ignored, $\mathcal{U}_t$ the units of analysis, $\mathcal{T}_t$ the temporal segmentation used to delimit events and histories, and $\mathcal{I}_t$ the situated interpretive practices that connect traces to reconstructed relations. The components are analytically separable but historically entangled.

There is no reason to assume

$$\Theta_t = \Theta_{t+k}. \quad (83)$$

A later interpretive configuration may contain new concepts, different temporal scales, new ways of individuating participants, revised standards of evidence, or a different partition of relationally relevant and irrelevant differences. A future observer may therefore ask a question that was not available at t , not merely provide a different answer to a question already formulated.

This distinction matters because much ordinary evidence preservation is organized around current questions. An institution records what presently appears relevant, converts events into available categories, and stores the resulting classifications. Such a practice can be entirely reasonable for immediate administration while remaining poor infrastructure for future re-cognition. If the future problem is simply that one variable was measured imprecisely, better measurement may suffice. If the future problem is that the relevant variable, unit, or relation was not represented at all, the archive may be unable to support reinterpretation regardless of how sophisticated later analysis becomes.

Definition 12.1 (Re-cognizability). Re-cognizability is the historically contingent capacity of later interpreters to reconstruct a past relation again under an interpretive configuration that may differ from the configuration under which the relation was originally observed, classified, or acted upon.

The definition deliberately does not say that later recognition is necessarily more correct. Historical distance can reveal and obscure. New concepts can illuminate previously invisible relations while also introducing new distortions. Re-cognizability preserves the possibility of renewed inquiry; it does not guarantee epistemic progress.

12.2 Re-cognizability Is Not Deferred Final Truth

A tempting model treats history as a gradual accumulation of evidence. At an early time, observers possess an incomplete picture; later they acquire more information; eventually the true classification is expected to stabilize. That model captures some investigations but is too narrow for the heterogeneous cases considered here.

When interpretive manifolds change, the later difference need not be representable as simply “more information” within the earlier problem space. Consider an alien–alien encounter initially recorded as a conflict between two individuals. A later interpretive system might reconstruct the apparent individuals as temporary organs of a distributed organism. Another might discover that the relevant temporal unit is not the observed encounter but a reproductive cycle lasting centuries. A later science might identify signal modalities absent from the original instrumentation. In each case the historical change concerns the constitution of the object of inquiry as much as the quantity of evidence about it.

Re-cognizability therefore differs from the preservation of a path toward final adjudication. Its object is the continued availability of the past for renewed constitution as an object of inquiry. A relation can be recognized, acted upon, and later re-recognized under a different partition of events, participants, functions, and normative saliences.

Claim 12.2 (Open-ended re-cognition). Preserving re-cognizability preserves the possibility of later reconstruction under interpretive resources not presently available; it does not commit the framework to a unique terminal interpretation of the past.

This claim is important for the paper’s broader ontological restraint. If normative and interpretive configurations are relationally generated, historical revisability cannot be treated as a simple march toward an ontologically pre-given moral description. The later reconstruction can be better supported for a particular purpose, more inclusive of previously erased relations, or more coherent with newly available evidence without thereby becoming the metaphysically final representation.

12.3 Changing Manifolds and the Reconstitution of the Normative Object

Section 3 argued that heterogeneous disagreement can occur before proposition-level disagreement because participants may not constitute the same normative object. The temporal version of that argument is equally important. A society can later cease to constitute a past event through the same object boundaries that originally organized judgment.

Let x_t denote an object of normative consideration as constituted under Θ_t . A later interpreter need not possess an object x_{t+k} that is naturally identical to x_t . The relation between them may be partial, contested, or purpose-dependent. A later reconstruction can preserve some dimensions of the earlier object while splitting others, combining what had been separated, or redescribing the relevant temporal and relational boundaries.

This possibility is familiar in less radical settings. Practices once represented as private household matters can later be reconstructed through categories of coercion, dependency, or structural inequality. Ecological processes once represented as isolated resource events can later be reconstructed through systems of cumulative environmental dependence. Medical descriptions can change when a previously unrecognized condition becomes conceptually available. The heterogeneous cases intensify this possibility because the units of agency, harm, function, and communication may themselves be uncertain.

The relevant temporal question is therefore not only whether later interpreters can recover the old answer. It is whether they can recover enough relational material to ask a differently constituted question. That demand places pressure on how records are produced in the present.

12.4 Preserving More Than the Present Quotient

Every practical record system performs some form of selection. It cannot preserve an event in its totality. Sensors have limited bandwidth; human observers notice some features rather than others; institutions store information according to purposes; databases require fields; reports compress histories into categories. Re-cognizability cannot eliminate these selections. It can, however, distinguish between necessary selection and unnecessary foreclosure.

Suppose the present quotient Q_t treats several distinct trajectories as equivalent because they all satisfy a category such as “attack.” An archive that preserves only the label “attack” retains the quotient

result while discarding the distinctions that the quotient suppressed. If future interpreters later reject the category or refine it, the original relational variation may no longer be recoverable.

This produces what may be called *quotient lock-in*.

Definition 12.3 (Quotient lock-in). Quotient lock-in occurs when a record preserves primarily or exclusively the output of a present classification or equivalence structure while discarding distinctions needed to reconsider that classification under a later interpretive configuration.

The problem can occur even where the original classification was reasonable. An emergency institution may need a small set of categories for operational response. A platform may require discrete incident codes. A conservation authority may need standardized labels for observed behavior. Re-cognizability does not demand that these categories be abandoned. It asks whether the record architecture preserves sufficient material alongside them to make later declassification or reclassification possible.

A useful archive for heterogeneous relations can therefore distinguish at least four kinds of material:

1. observed or instrumentally captured traces;
2. provenance and acquisition context for those traces;
3. contemporaneous interpretations and classifications;
4. information about the transformations, exclusions, and uncertainty involved in producing those interpretations.

The distinction is not a claim that the first category is epistemically pure. A sensor trace already depends on apparatus, calibration, placement, sampling frequency, and an ontology of what can be measured. Human “observation” is likewise concept-laden. The point is comparative: records can preserve materials at different distances from the final institutional classification, together with enough provenance to make those distances inspectable.

12.5 The Archive as an Interpretive Architecture

An archive is not merely a passive container of past facts. Its schema helps determine what later observers can search, compare, aggregate, and reconstruct. Decisions about fields, identifiers, event boundaries, metadata, retention periods, redaction, and access can therefore shape the future space of interpretation.

For heterogeneous relations, at least seven archival dimensions deserve explicit attention:

1. **Trace retention:** what signals, state changes, images, logs, environmental measurements, or interaction records are retained?
2. **Provenance:** who or what produced the record, with which instrument or interface, under what conditions, and with which transformations?
3. **Temporal ordering:** can later interpreters reconstruct sequences, durations, recurrences, interruptions, and long-horizon trajectories?
4. **Relational context:** are resource flows, dependencies, communication channels, environmental conditions, and relevant surrounding actors represented?
5. **Interpretive plurality:** are competing contemporaneous interpretations preserved, or only the institutionally adopted classification?
6. **Uncertainty and omission:** does the record mark what was unknown, contested, inaccessible, filtered, or deliberately excluded?
7. **Version history:** can later interpreters see how classifications, schemas, and conclusions changed rather than receiving the latest category as though it had always existed?

These dimensions are not a universal archival standard. Different contexts face different privacy, security, storage, welfare, and feasibility constraints. They are analytical prompts for identifying where future conceptual freedom can be preserved or foreclosed.

The political-economic dimension is also unavoidable. Record creation and retention consume resources. Some participants possess storage capacity, sensor infrastructure, legal authority, or institutional continuity; others do not. An apparently neutral demand to “preserve the traces” can reproduce asymmetry if only powerful participants can decide what counts as a trace, maintain the archive, or authorize later access. Re-cognizability therefore has a governance problem internal to it: who controls the infrastructure through which future recognition remains possible?

12.6 Observation, Interpretation, and the Myth of Raw Preservation

The language of preserving “raw data” is useful operationally but philosophically dangerous if it suggests an uninterpreted record of reality. No archive escapes mediation. Even the choice to record electromagnetic frequency rather than chemical composition reflects an available measurement system. Compression changes information. Camera position creates a field of view. Logs depend on software instrumentation. Biological observation depends on sampling protocols. Translation can alter semantic structure. Preservation always begins from a historically situated apparatus.

The appropriate aspiration is therefore not rawness but *inspectable mediation*. A record can make visible how it was produced, which transformations were applied, which interpretive decisions were made, and where uncertainty remains. This supports later reconstruction because future interpreters can evaluate not only the archived content but the epistemic pathway by which the content became archival material.

A minimal archival object can be represented as

$$\mathcal{A}_t = (D_t, P_t, K_t, V_t, L_t, H_t), \quad (84)$$

where D_t denotes retained data or traces, P_t provenance, K_t contemporaneous classifications, V_t alternative interpretations or uncertainty annotations, L_t known limitations and exclusions, and H_t version history. The notation is deliberately modest. It identifies components that may support future reconstruction without claiming that any archival package can preserve the relation in full.

Remark 12.4. The value of $\mathcal{A}_t$ for re-cognizability depends partly on what future interpreters require, which is precisely what present actors cannot fully know. Preservation is therefore a practice under uncertainty about future epistemic demand.

This uncertainty explains why preserving some relational richness beyond current administrative need can matter. It also prevents the framework from specifying an exhaustive list of data that must always be retained.

12.7 Irreversible Action and Epistemic Closure

The temporal problem becomes most acute when action can destroy the object or traces needed for later reconstruction. Deleting an artificial agent, exterminating an unfamiliar organism, permanently altering memory, destroying a habitat, overwriting logs, or terminating communication can change not only the normative situation but the possibility of learning what that situation was.

The distinction between practical closure and epistemic closure is useful here. Practical closure occurs when a decision must be made for action despite incomplete interpretation. Epistemic closure occurs when the action or accompanying record practice removes the possibility of materially revisiting the interpretation later. The two can coincide, but they need not.

A provisional quarantine can be practically decisive while preserving participants, communication, and records. A temporary computational separation can interrupt an interaction without deleting the

systems involved. A conservation intervention can halt an observed process while documenting the circumstances and preserving samples. Conversely, an action can both resolve the immediate practical problem and destroy the possibility of later recognition.

This yields a working proposition:

Proposition 12.5 (Non-equivalence of practical and epistemic closure). *A decision that closes an immediate practical question need not close the future epistemic question, and the justification for one form of closure does not by itself justify the other.*

The proposition does not establish a universal duty to preserve. It identifies an additional consequence that practical judgment should notice. When two responses are otherwise comparable, their effects on future re-cognizability can constitute a relevant difference under some operative nomoi. Where preservation imposes severe harm, risk, cost, or violation of participant interests, the balance can be different.

12.8 Preservation Is Not an Absolute Norm

Re-cognizability can become dangerous if converted into a supreme value. Unlimited retention can violate privacy, prolong surveillance, preserve harmful material, expose vulnerable participants, consume scarce resources, or impede legitimate forgetting. Maintaining an artificial system indefinitely for future study may itself constitute domination under some relational configuration. Preserving biological material may create ecological or security risks. Keeping communication channels open can facilitate ongoing harm.

The framework therefore does not claim

$$\text{more preservation} = \text{more justice.} \quad (85)$$

Nor does it treat reversibility as an unconditional substantive norm. Re-cognizability is one consideration whose relevance depends on the relational field, the consequences of preservation, the operative normative configuration, and the availability of less harmful forms of retention.

Several trade-offs are especially important:

- preservation versus privacy or confidentiality;
- preservation versus immediate safety;
- preservation versus effective exit and the right not to remain indefinitely inspectable;
- preservation versus ecological or computational cost;
- provenance transparency versus security;
- interpretive plurality versus the risk of retaining defamatory, manipulative, or strategically fabricated accounts.

The practical question is consequently not whether everything should be preserved. It is which forms of relational material merit preservation, for which purposes, under which access conditions, and at whose cost. These are themselves governance questions and should remain open to revision.

12.9 Re-cognizability under Epistemic Asymmetry

Asymmetric epistemic access can be reproduced historically if archives disproportionately preserve the perspective of the better-understood or institutionally dominant participant. The familiar participant may already possess recognized identifiers, diagnostic categories, legal standing, standardized data formats, and institutional advocates. The unfamiliar participant may appear only through externally assigned labels.

This means that the epistemic asymmetry discussed in Section 6 has a temporal multiplier. Present asymmetry can become future historical asymmetry when record systems preserve one side in detail while reducing the other to compressed classifications. Later interpreters may then mistake archival richness for ontological or normative centrality.

Consider an Earth animal interacting with an unfamiliar alien. Human institutions may record the animal's species, physiological markers, vocalization, movement, stress indicators, habitat, and conservation status. The alien may be represented only as "unknown organism," "contact event," or "threat source." Even if the immediate classifications remain cautious, the archive already contains radically different epistemic resolutions. Future reconstruction will inherit that imbalance.

A re-cognizability-sensitive archive can therefore disclose differential resolution itself. It can record where one participant is richly represented and another is weakly represented, where translation was unavailable, where sensor design favored one embodiment, and where institutional categories had no adequate field. The goal is not artificial symmetry. It is to prevent epistemic inequality from disappearing into the apparent neutrality of the historical record.

12.10 Future Manifolds and Archival Freedom

If $\mathcal{M}_t$ can change, archive design influences what future manifolds can do with the past. This does not mean an archive can generate future concepts directly. It means that some archival practices leave more relational distinctions available for future conceptual work than others.

The relevant freedom is not unlimited interpretive license. Future interpretations remain constrained by preserved traces, provenance, coherence requirements, competing records, and whatever evidential practices later communities develop. The point is that current classifications should not become the only surviving representation simply because they were operationally convenient.

One can describe this as *archival freedom for future interpretation*: the degree to which retained material allows later interpreters to revisit present quotienting, units, temporal segmentation, and normative object construction. This freedom is always finite. Every archive has losses. But the distinction between preserving a classification and preserving the possibility of reconsidering that classification is analytically significant.

This gives re-cognizability a stronger formulation than "keep enough evidence." The relevant preservation target includes the conditions under which the evidence can later be reorganized into a different relational object.

12.11 Re-cognizability and Cross-Interpretive Interfaces

Section 8 introduced cross-interpretive interfaces as local structures through which heterogeneous participants can coordinate without complete semantic or normative identity. Such interfaces also have histories. A protocol, translation convention, shared signal, negotiated threshold, or governance rule can later become obsolete or appear to have encoded one participant's manifold disproportionately.

Preserving the interface alone is therefore insufficient. Where feasible, later interpreters should be able to reconstruct how the interface was formed, which alternatives were rejected, which asymmetries shaped participation, and which meanings remained unresolved. Otherwise a contingent coordination device can appear retrospectively as though it expressed an obvious common norm.

The same applies to failed interfaces. A negotiation that collapses, a translation that proves unstable, or an attempted coordination protocol that one participant refuses can contain valuable information about manifold mismatch. Preserving only successful convergence selects history in favor of compatibility and can erase the conditions under which coordination was impossible.

Re-cognizability thus concerns not only objects and events but also the history of interpretive mediation itself.

12.12 The Four Heterogeneous Stress Tests Revisited

In an AI–AI relation, re-cognizability can depend on retaining interaction logs, model states where feasible, resource allocation histories, communication records, modification events, and the software or interface versions through which those records were produced. A later understanding of artificial identity, memory continuity, or functional harm may differ substantially from the categories used when the event occurred. Retaining only an incident label such as “malicious agent” can create severe quotient lock-in.

In an AI–animal relation, preservation must accommodate radically different evidential forms. Artificial logs can be extremely granular while animal experience is reconstructed through behavior, physiology, ecology, and human observation. The asymmetry can also run in the opposite direction if the artificial system is opaque or its internal states are unavailable. Re-cognizability requires preserving the heterogeneity of evidence rather than forcing both sides into a common data form that destroys relevant differences.

In an Earth–animal–alien relation, the danger of familiarity-based archival anchoring is especially strong. Human institutions can easily generate rich animal-centered records and sparse alien-centered records. A cautious archive would preserve the animal evidence while also documenting what could not be measured or interpreted about the alien, the instrumentation limits, environmental context, competing hypotheses, and any signals that did not fit existing categories.

In an alien–alien relation, re-cognizability may become the dominant epistemic objective precisely because present classification is weak. Humans may not know whether observed units are individuals, whether apparent destruction is harm, whether communication is occurring, or whether the relevant temporal scale has been captured. In such a case the most valuable record may be one that preserves relational richness with minimal unnecessary compression while clearly documenting the unavoidable mediation of the recording apparatus.

None of these cases implies that preservation is always permissible or feasible. They show how heterogeneous relations make the temporal consequences of classification unusually visible.

12.13 Re-cognizability as an Institutional Design Question

The preceding arguments can be translated into modest institutional design questions without turning them into universal rules. A re-cognizability-sensitive institution can ask:

1. Which present classifications are operational conveniences rather than settled descriptions?
2. Which distinctions are being discarded by the current quotient structure?
3. What provenance is necessary for later interpreters to understand how records were produced?
4. Where is epistemic resolution asymmetric across participants?
5. Which alternative interpretations are sufficiently grounded to merit preservation alongside the adopted one?
6. What forms of practical action would irreversibly destroy participants, traces, or interfaces needed for later reconstruction?
7. What privacy, safety, exit, resource, or security costs would preservation impose?
8. Who controls retention, access, deletion, schema revision, and future reinterpretation?

These questions do not yield a single archival policy. They make visible a temporal dimension of relational governance that is often hidden when institutions optimize solely for present adjudication or administration.

12.14 What This Section Adds

Historical understanding changes; archives shape knowledge; records are selective; concepts evolve. None of these propositions is new. The contribution of this section is narrower and tied to the paper's heterogeneous-relations framework.

First, it formulates re-cognizability at the level of changing interpretive configurations rather than merely accumulating evidence. The future difference can concern concepts, quotient structures, units of analysis, temporal segmentation, and the constitution of the normative object itself.

Second, it distinguishes practical closure from epistemic closure. Present action can be necessary without requiring that the possibility of later reinterpretation be destroyed.

Third, it identifies *quotient lock-in*: the loss of future interpretive possibility when archives preserve the output of present classification while discarding distinctions that classification suppressed.

Fourth, it treats provenance, interpretive plurality, uncertainty, limitations, and version history as components of re-cognizability rather than treating the archive as a neutral store of observations.

Fifth, it extends epistemic asymmetry temporally. Unequal present access can become unequal historical visibility, thereby allowing archival richness on one side of a relation to masquerade as greater ontological or normative significance.

Sixth, it connects re-cognizability to cross-interpretive interfaces. Future interpreters may need to reconstruct not only what participants did, but how partial common meanings, protocols, and normative objects were produced or failed to form.

Finally, the section places a firm limit on the preservation argument. Re-cognizability is not a transcendent supreme norm. Preservation can conflict with privacy, safety, exit, resource constraints, ecological integrity, and other relationally real concerns. Its role is to expose an additional dimension of present action: whether the way we act now leaves the past available for later re-cognition when the interpretive manifold itself may have changed.

13 Discussion and Open Problems

The preceding sections have developed a preliminary framework for thinking about normative relations under heterogeneity without treating heterogeneity itself as a source of obligation, without presuming a privileged external observer, and without assuming that the relevant interpretive space is fixed in advance. The resulting picture is intentionally more modest than a general moral theory. It does not identify a universal property that confers moral status, provide a complete criterion for legitimate intervention, or supply a decision procedure capable of resolving all heterogeneous conflicts. Its contribution is primarily analytical: it separates several problems that are often compressed into a single question about whether an unfamiliar entity “has moral status” or whether an observer “ought to intervene.”

This section draws together those analytical results, clarifies which claims are intended as extensions rather than originality claims over established relational traditions, and identifies the principal unresolved problems. The emphasis is therefore diagnostic. A framework for heterogeneous relations is useful only if it makes visible where judgment remains underdetermined, where interpretation itself is unstable, and where apparently procedural solutions may reproduce the very epistemic and normative asymmetries they are designed to manage.

13.1 What the Argument Has Established

The paper began from cases in which familiar normative supports are progressively weakened: artificial–artificial, artificial–animal, Earth–animal–alien, and alien–alien relations. These cases were not introduced as a hierarchy of moral difficulty or as predictions about future entities. Their function was to expose assumptions that become difficult to see in familiar human–human settings. Shared embodiment, language, social institutions, legal classifications, historical memory, and common expectations can make normative interpretation appear immediate even when it depends upon a dense inherited interpretive infrastructure.

Within that problem setting, several results can now be stated with greater precision.

First, heterogeneity among participants and heterogeneity in epistemic access to participants are distinct variables. A relation between highly dissimilar entities can be comparatively well studied, while a relation between superficially similar entities can remain epistemically opaque. Conversely, an interpreter can possess rich access to one participant and little access to another. Section 4 therefore treated epistemic position as relational and multidimensional rather than as a simple function of species or substrate.

Second, unequal epistemic access can shape reconstruction of the relation itself. This is stronger than the familiar observation that interpreters may sympathize more readily with familiar beings. When one participant is richly represented by scientific categories, institutional records, behavioral expectations, interfaces, and legal concepts while another remains weakly represented, the better-understood participant can supply the vocabulary through which the entire relation is rendered intelligible. Section 6 described this as asymmetric epistemic anchoring of relational reconstruction.

Third, relational reconstruction benefits from separating at least four analytical objects: traces, structural relations, functional consequences, and participant-relative meanings. Section 5 did not claim that these are temporally discrete stages or that every case permits a clean decomposition. The distinction instead disciplines inference. A system can display restricted option space, memory alteration, persistent resource asymmetry, or repeated interruption without the interpreter already possessing sufficient grounds to classify those observations as oppression, suffering, punishment, care, or consent.

Fourth, not all epistemic failure is uncertainty of the same kind. The paper distinguished uncertainty within an available interpretive space, conceptual insufficiency, and deeper mismatch between interpretive manifolds. Additional evidence may help with the first problem while leaving the latter two substantially unchanged. The difference matters because a demand for “more data” can be misplaced when the available categories or dimensions of interpretation are themselves inadequate.

Fifth, normative formation across heterogeneous participants need not begin from a fully shared normative object. Section 8 argued that participants may differ not only over how an object should be evaluated but also over what the object of evaluation is. Partial and revisable normative interfaces may therefore be necessary before substantive normative comparison is possible. Such interfaces do not amount to semantic identity, consensus, or legitimacy.

Sixth, no participant occupies an automatically privileged external position. Section 9 replaced the simple third-party image with a relational field in which causal implication, dependency, control, affectedness, request, institutional role, epistemic access, and practical capacity can be distributed across many participants. Yet no single positional feature was treated as sufficient to establish obligation or authority.

Seventh, practical judgment requires distinctions that are easily collapsed in humanitarian, governance, and AI-ethics discourse. Ethical salience, normative standing, reasons, obligations, permissions, authority, and action are not interchangeable. Section 10 consequently preserved non-involvement as a genuine possible outcome while also rejecting the idea that non-involvement is automatically neutral.

Eighth, governance questions become especially difficult when local relations modify shared relational conditions. Section 11 proposed that the scope of governance should be analyzed in relation to the footprint of generated consequences, while rejecting the inference that affectedness or control automatically confers sovereignty. Governance of a shared condition was kept analytically distinct from governance of every relation that occurs within that condition.

Finally, the paper extended re-cognizability from concept revision to possible transformation of the interpretive manifold itself. Section 12 argued that archives, records, and institutions can preserve or destroy future possibilities of reinterpreting a relation. Quotient lock-in is one mechanism of loss: when present classifications survive while the richer relational traces that could later challenge those classifications disappear, a temporary interpretive structure can become historically difficult to revise.

These results are mutually supporting but should not be mistaken for a complete normative system. Most of them concern the architecture of inquiry and judgment rather than the final content of obligation.

13.2 What Is and Is Not Claimed as New

The paper deliberately does not claim originality for the general propositions that interpretation is historically situated, that subjects are relationally constituted, that care and dependency matter ethically, that capabilities concern substantive opportunities, that recognition is socially mediated, that structural responsibility can be distributed, that meaning can emerge through interaction, or that polycentric governance can outperform a single centralized authority in some settings. Section 2 reviewed several traditions in which those claims are already developed in substantial depth.

The narrower contribution lies in combining the heterogeneous-relations problem with a set of analytical distinctions that are often treated separately. The proposed contribution is best understood as a configuration of problems rather than a declaration that every element is unprecedented. In particular, the paper foregrounds four claims that merit further testing.

Claim 13.1 (Epistemic geometry of heterogeneous relations). Normative reconstruction can depend on the distribution and directionality of epistemic access among participants, not merely on the intrinsic or attributed properties of the entities involved.

Claim 13.2 (Asymmetric anchoring of relational reconstruction). When epistemic access is substantially richer for one participant than for another, the better-represented participant can supply the categories through which the relation as a whole is reconstructed, even without deliberate bias by an individual interpreter.

Claim 13.3 (Distinct epistemic regimes). Uncertainty within a shared interpretive space, conceptual insufficiency, and interpretive-manifold mismatch are analytically different conditions and can require different forms of response.

Claim 13.4 (Normative-object formation under heterogeneity). Cross-interpretive normative coordination may require the provisional constitution of a partially shared object of evaluation before disagreement about substantive norms can be meaningfully compared.

These claims are intentionally narrower than a general theory of relational ethics. They are also provisional. Their value will depend on whether they can generate sharper diagnoses, better empirical questions, or more defensible institutional designs than existing vocabularies alone.

13.3 Open Problem I: Norm Justification without a Transcendent Shortcut

The deepest unresolved problem is also the most familiar one for the broader Generative Relational programme. If normative structures are historically generated and relationally real, their emergence does not establish their justification. A stable norm can reproduce domination, exclusion, misrecognition, or systematic epistemic suppression. Historical persistence is therefore not a sufficient normative criterion.

At the same time, the present framework does not simply introduce a fixed external norm N^* and use it to adjudicate every generated order. Doing so would answer the problem by abandoning the methodological commitments that motivated the inquiry. The challenge is to explain how critique can operate when both the object of evaluation and the available normative vocabulary are historically situated.

Several candidate resources remain open rather than settled. Internal contradiction can expose cases in which a normative order defeats commitments that are already operative within it. Counter-norms generated by excluded or subordinated participants can reveal suppressed possibilities of interpretation. Comparative reconstruction can show that a relation classified as voluntary depends upon option spaces produced by prior coercive conditions. Historical analysis can expose how apparently neutral categories were stabilized through asymmetric power. None of these, however, automatically supplies a complete criterion of justice.

The open question is therefore not merely whether generated norms can be criticized. Clearly they can. The harder question is what warrants one critique rather than another when no final transhistorical standpoint is assumed. This problem should remain explicit rather than being hidden behind terms such as “generativity,” “openness,” or “non-domination” unless those terms themselves receive independent normative justification.

13.4 Open Problem II: The Status of the Interpretive Manifold

The language of an interpretive manifold performs useful analytical work in this paper, but its exact status remains deliberately underdetermined. Section 3 used $\mathcal{M}_t$ as a compact representation of the distinctions, concepts, quotient structures, units of analysis, temporal segmentations, and other resources through which a relation can become intelligible. This should not be confused with a claim that such spaces already satisfy the mathematical conditions of a differentiable manifold.

Further work must determine how much formal structure is genuinely warranted. At least three levels are possible. At the weakest level, “manifold” remains a disciplined metaphor for a historically structured space of interpretive possibility. At an intermediate level, local neighborhoods, partial correspondences, and transformations between interpretive regions could be modeled without assuming a globally smooth structure. At a stronger level, particular domains might admit explicit geometrical or topological representations derived from empirical data or formal semantic systems.

The danger is formal inflation: mathematical language can create an appearance of precision where the relevant objects remain conceptually unsettled. The opposite danger is premature abandonment of formalization, which would leave important distinctions between local correspondence, global translation, quotienting, and dimensional mismatch underspecified. The appropriate level of formal commitment is therefore an open methodological problem.

13.5 Open Problem III: Identifying Manifold Mismatch in Practice

A related difficulty concerns diagnosis. If an interpreter already works within $\mathcal{M}_X$, how can that interpreter know that the problem is a mismatch of interpretive manifolds rather than ordinary uncertainty or conceptual insufficiency within its own manifold?

The paper proposed diagnostic signs rather than a decisive test: persistent anomaly, unstable translation, repeated failure of new evidence to resolve disagreement, incompatible units of analysis, disagreement over temporal segmentation, systematic remainder after attempted correspondence, and participant responses that repeatedly resist the categories imposed upon them. These indicators remain fallible. Any diagnosis of manifold mismatch is itself made from within an interpretive configuration.

This generates a reflexive problem. The framework asks interpreters to notice limitations that may be partly invisible from their current position. Institutional diversity, adversarial interpretation, participant testimony, model pluralism, preservation of anomalous data, and cross-disciplinary reconstruction may help, but none guarantees escape from a shared blind spot. A future research programme should therefore examine conditions under which interpretive systems become capable of detecting their own categorical inadequacy.

13.6 Open Problem IV: Partial Correspondence without False Equivalence

Cross-interpretive coordination often depends on establishing some local correspondence between heterogeneous systems. Yet useful correspondence can easily be mistaken for identity. If two participants respond similarly to a signal, that does not establish that the signal has the same meaning for both. If two systems preserve a state under the same protocol, that does not establish that the state occupies the same normative role.

The paper therefore treated correspondence as purpose-indexed and revisable. Future work should specify what must be preserved for a correspondence to be adequate for a particular task. Possibilities include invariance of behavioral response, preservation of dependency structure, similarity of counterfactual sensitivity, preservation of exit conditions, or agreement over a limited operational threshold. Different tasks may require different invariants.

This problem connects directly to the wider Generative Relational question of equivalence modulo a quotient. Two heterogeneous relational histories may be treated as equivalent only relative to selected distinctions. The normative issue is then who selects those distinctions, which differences are discarded, and whether the quotient itself becomes a mechanism of domination.

13.7 Open Problem V: Power in the Formation of Shared Normative Objects

Section 8 treated the formation of a partially shared normative object as a possible precondition for coordination. But the production of such an object is never politically innocent. One participant may control the language, sensors, archives, computational infrastructure, legal categories, translation layer, or institutional procedure through which the common object is constituted.

A shared object can therefore be shared only in a weak procedural sense while remaining substantively organized around one participant's manifold. The risk is especially severe when the less familiar participant cannot contest the representational infrastructure in which its claims are translated. Interface capture is one expression of this problem.

Future work should distinguish at least representational power, infrastructural power, agenda-setting power, revision power, and exit power within cross-interpretive interface formation. It should also ask whether some asymmetries are unavoidable and, if so, what forms of disclosure, contestability, redundancy, or institutional plurality can reduce their effects without pretending to eliminate them.

13.8 Open Problem VI: Obligation, Standing, and Authority after Ontological Suspension

Ontological suspension prevents the paper from treating membership in the category "human," "animal," "AI," or "alien" as a self-sufficient source of obligation. But suspension does not itself tell us which relational conditions are sufficient for standing, obligation, permission, or authority.

The multidimensional positional analysis of Section 9 provides a vocabulary: causal implication, dependency, control, exposure, request, role, epistemic access, and practical capacity can all matter. Yet the framework intentionally rejects the claim that any one dimension mechanically entails a duty. The unresolved task is to explain how combinations of these dimensions become normatively weighty within a given relational history.

This is particularly difficult when the participants themselves do not share a normative vocabulary. A request for assistance may be uninterpretable. Dependency may be obvious functionally but not recognized as morally relevant by all participants. A role can be historically inherited from an institution whose legitimacy is itself contested. Capacity to assist can coexist with severe uncertainty about the effects of assistance.

A mature theory would need to clarify not only when obligations arise, but also their scope, bearer, defeasibility, and relation to authority. The present paper prepares that inquiry without resolving it.

13.9 Open Problem VII: Action under Irreversibility and Deep Epistemic Difference

The distinction between practical closure and epistemic closure allows action without pretending that interpretation is final. Yet some situations make this distinction difficult to sustain. An irreversible intervention can eliminate the very participant, relation, or environment whose later reinterpretation would otherwise remain possible. Conversely, refusing to act can itself permit irreversible loss.

The hypothesis that protective action may sometimes be justified at a lower epistemic threshold than blame or punishment remains plausible but underdeveloped. It requires a theory of asymmetric error costs, reversibility, temporal urgency, and the distribution of risks among differently situated participants. It also requires care because "protection" can itself become a paternalistic classification imposed from outside.

Future work should therefore distinguish interventions that preserve option space from those that foreclose it, temporary separation from permanent domination, evidence preservation from indefinite surveillance, and emergency restraint from normalized control. The framework should not assume that the action called "protective" by one interpreter is functionally protective for the participants concerned.

13.10 Open Problem VIII: Governance Boundaries and the Expansion of Shared Conditions

The concept of a shared relational condition is useful because it avoids treating every local relation as collectively governable. Yet shared conditions can be defined narrowly or expansively. Almost any relation can be said to have indirect effects on a wider ecology, economy, information environment, or institutional system if the causal horizon is extended far enough.

This creates a boundary problem. If every remote externality is sufficient to establish collective standing, the category of protected locality may collapse. If only immediate effects count, important structural consequences can be ignored. The appropriate boundary cannot be read directly from causal connectedness alone.

A future account must therefore examine scale, magnitude, persistence, reversibility, substitutability, dependency, and the distribution of consequences. It must also confront boundary power: the authority to define what counts as a shared condition can itself expand governance jurisdiction. Polycentric architecture may distribute that power, but it does not by itself justify the chosen boundaries.

13.11 Open Problem IX: Capability Evaluation across Heterogeneous Forms of Life

The capability approach offers an important vocabulary for effective possibilities rather than formal permissions alone. This paper has used related language when discussing option spaces and functional consequences. Radical heterogeneity, however, creates a difficult evaluative problem: a reduction in an externally measurable option space is not automatically a reduction in what matters for the participant.

For a familiar animal, biological and behavioral knowledge may support cautious claims about mobility, reproduction, sociality, or environmental dependence. For an unfamiliar artificial system or alien life form, the relevant functionings may be unknown. Even the persistence of an apparent individual may not be the appropriate evaluative unit.

The open problem is therefore how to retain the capability approach's sensitivity to effective possibility without projecting a human or species-familiar list of valuable functionings onto entities whose interpretive and functional organization may differ radically. Participant-relative evidence, relational history, and cross-interpretive interfaces may help, but the problem is not solved by relabeling option-space change as capability loss.

13.12 Open Problem X: Collective, Distributed, and Non-Individual Participants

Many examples in this paper use labels such as *A* and *B* for clarity. That notation risks preserving an individualist ontology even while the substantive argument questions it. Some entities may be collective, distributed, symbiotic, temporally discontinuous, or constituted through relations that make stable individuation difficult.

This matters because the unit of ethical analysis affects every later step. Harm to one apparent component may preserve the wider system. What looks like memory loss for an individual process may be ordinary state redistribution in a collective architecture. Reproduction, death, exit, ownership, and consent may all depend on where boundaries are drawn.

Future work should therefore extend relational reconstruction to cases in which the candidate participant set is itself uncertain. The question is not only how heterogeneous participants relate, but how participants are constituted as participants within a particular interpretive manifold.

13.13 Open Problem XI: Empirical and Experimental Research Designs

The present paper is primarily conceptual. Its claims require empirical pressure if they are to become more than an internally coherent vocabulary. Several research designs appear possible without needing actual extraterrestrial contact.

Artificial multi-agent systems can test how different observation interfaces alter reconstruction of the same interaction. Researchers can deliberately create asymmetric observability, give interpreters

different access to logs or internal states, and measure whether relational classifications anchor around the better-represented agent. Human–animal interaction research can examine how species familiarity affects interpretation of ambiguous cross-species encounters. Cross-cultural and interdisciplinary studies can test how stable a reconstructed normative object remains when observers use different conceptual schemes or professional taxonomies.

Archival experiments are also possible. The same complex interaction can be stored in a highly classified summary, a provenance-rich multimodal record, and several intermediate representations. Later interpreters can then be asked to reconstruct the event under new conceptual instructions. Such work could operationalize quotient lock-in and provide evidence about which archival practices preserve recognizability most effectively.

The objective of empirical work should not be to “prove” the Generative Relational framework in the abstract. It should identify where the proposed distinctions improve diagnosis, where they collapse into existing constructs, and where they fail to predict or explain actual interpretive behavior.

13.14 Open Problem XII: Scope Conditions and Risks of Over-Generalization

A framework designed to remain applicable under radical heterogeneity can become too general to constrain anything. If every disagreement is described as manifold mismatch, every institution as relationally generated, every norm as historically emergent, and every boundary as contested, the vocabulary loses discriminatory power.

Several scope restrictions are therefore essential. Ordinary uncertainty should not be redescribed as conceptual insufficiency without evidence. Conceptual insufficiency should not be escalated to manifold mismatch merely because participants disagree. The language of heterogeneous relations should not erase domain-specific knowledge from animal welfare science, AI safety, law, medicine, political theory, or ecology. Nor should ontological suspension be used as an excuse to ignore well-supported empirical claims about the capacities and vulnerabilities of familiar entities.

The framework is most useful where there is a genuine problem of heterogeneous interpretation, asymmetric access, disputed units, unstable normative objects, or historically changing conceptual resources. Where those conditions are absent, simpler theories may be preferable.

13.15 Research Programme after This Paper

The paper therefore ends its substantive argument with a research programme rather than a final normative rule. At least five lines of work follow directly.

First, the epistemic geometry proposed in Sections 4 and 6 requires operationalization. Researchers need ways to describe multidimensional access without reducing it prematurely to a single distance measure.

Second, relational reconstruction requires domain-specific methods. The distinction among traces, structure, function, and participant-relative meaning must be translated into evidential practices appropriate to artificial systems, animals, ecological entities, and other possible subjects.

Third, cross-interpretive interface formation requires a political theory of representation and contestability. A useful interface must support coordination without silently installing one participant’s ontology as the common world.

Fourth, practical judgment requires further normative theory. The paper has separated salience, standing, obligation, permission, authority, and action; subsequent work must investigate how those relations are generated, criticized, and revised in concrete histories.

Fifth, re-cognizability requires institutional design. Archives, reporting systems, scientific data infrastructures, governance protocols, and legal records can all be evaluated in terms of whether they preserve enough relational richness for later reinterpretation without imposing unlimited preservation burdens.

The unifying question is not whether one universal ethics can be mechanically extended from humans to every possible entity. It is how normative relations can become intelligible, contestable, and practically

governable when the participants, interpreters, concepts, and shared conditions through which normativity is articulated are themselves heterogeneous and historically changing. The framework developed here does not resolve that question. It attempts to make its internal structure sufficiently visible that later normative and empirical work can address it without relying on assumptions that radical heterogeneity places in doubt.

14 Conclusion

This paper began from a simple but difficult problem. When relations involve entities that differ substantially in embodiment, cognition, communication, historical experience, functional organization, or normative vocabulary, the difficulty is not exhausted by asking whether each entity possesses moral status. The relation itself may be difficult to reconstruct, the relevant object of normative evaluation may be unstable, and the interpretive space within which categories such as harm, dependence, autonomy, consent, or responsibility become meaningful may not be shared in advance. Radical heterogeneity therefore places pressure not only on substantive moral judgment but also on the conditions under which a normative question can first become intelligible.

The paper has proposed a preliminary Generative Relational account of this problem. Its starting point is deliberately non-foundational in a narrow ontological sense. It does not assume that obligation is an intrinsic property attached to a class of entities, including human beings, nor does it infer the absence of normativity from the absence of such a property. Instead, it treats normative structures as capable of becoming relationally real through historically generated relations, interpretations, institutions, practices, dependencies, powers, and forms of coordination. This position suspends ontological finality without reducing ethical life to fiction or arbitrariness.

A central implication is that interpretation cannot always be modeled as the application of a fixed conceptual vocabulary to a stable external object. The paper has used the term *interpretive manifold* as a working analytical scaffold for the distinctions, concepts, quotient structures, units of analysis, and temporal segmentations through which a relation becomes representable. Under heterogeneity, participants and interpreters may not merely assign different values to the same object. They may constitute different objects of evaluation, preserve different distinctions, or organize the relevant field along dimensions that are only partially comparable. The interpretive manifold itself can therefore be historically and relationally generated, modified, and sometimes partially shared.

This conclusion summarizes the paper's principal analytical results, clarifies the role of its heterogeneous stress tests, and closes with the methodological posture that follows from the framework.

14.1 From Entity Classification to Relational Reconstruction

Many ethical debates begin by asking what kind of entity stands before us. Is it sentient, rational, autonomous, conscious, vulnerable, capable of flourishing, capable of reciprocity, or eligible for recognition? Those questions remain important. The argument of this paper has been that they do not exhaust the epistemic problem created by heterogeneous relations.

The relevant unit may be a relation rather than an isolated entity, and that relation is not transparently available. Section 5 therefore distinguished observational traces, structural relations, functional consequences, and participant-relative meanings. The purpose of this distinction was not to impose a rigid sequence of inquiry. It was to discipline the movement from what is observed to what is normatively asserted. A change in resource access, memory, communication, mobility, dependency, or effective option space can sometimes be reconstructed with greater confidence than the claim that the same change constitutes punishment, domination, consent, care, or suffering for a particular participant.

The framework also separates heterogeneity among participants from heterogeneity in epistemic access to them. Section 4 showed why participant type alone is an inadequate proxy for epistemic difficulty. Two artificial agents may be highly heterogeneous in architecture while remaining comparatively observable. A familiar terrestrial animal and an unfamiliar alien may be less symmetrical epistemically even if

their interaction is physically visible. What matters is the distribution of communicative access, historical records, causal understanding, interpretive resources, and opportunities for reciprocal correction.

This distribution can itself distort reconstruction. Section 6 described the problem of asymmetric epistemic anchoring: when one participant is richly represented and another poorly represented, the better-understood participant can supply the categories through which the entire relation is interpreted. The familiar side does not merely attract sympathy. It can organize the normative object itself. In that sense, epistemic asymmetry can become relational rather than merely individual.

The resulting methodological lesson is limited but important. Normative judgment under heterogeneity should disclose the structure of its own access conditions. It should distinguish what is directly observed from what is structurally inferred, functionally reconstructed, or attributed as participant-relative meaning. It should also make visible when one participant's evidential richness is carrying disproportionate interpretive weight.

14.2 Three Epistemic Problems That Require Different Responses

A second major result concerns the structure of epistemic failure. The paper has resisted treating every interpretive difficulty as ordinary uncertainty. At least three conditions should be distinguished.

The first is uncertainty within an available interpretive space. The relevant categories and questions are sufficiently stable, but evidence is incomplete or conflicting. Additional observation, measurement, testimony, or causal analysis may reduce the uncertainty.

The second is conceptual insufficiency. The available interpretive vocabulary does not adequately classify what is being observed. More evidence alone may simply produce a larger quantity of poorly organized traces. Concept formation, conceptual revision, or preservation of unresolved differences may be required before the relation can be represented adequately.

The third is interpretive-manifold mismatch. Here the difficulty is not merely that one concept is missing. Participants or interpreters may organize the phenomenon through different units, dimensions, temporal boundaries, or quotient structures. What one system treats as an individual event may be embedded in a lifecycle, collective process, distributed identity, or relational structure that another system does not represent in comparable terms.

These three conditions have different practical implications. Treating conceptual insufficiency as ordinary uncertainty can lead to misplaced demands for more data. Treating manifold mismatch as a vocabulary gap can lead to false translation. Conversely, invoking manifold mismatch too quickly can become an excuse for unnecessary skepticism. The distinctions are therefore diagnostic, not rhetorical. They should be supported by evidence about where reconstruction actually fails.

The heterogeneous cases used throughout the paper serve primarily to stress these distinctions. Relations between two artificial systems test whether comparatively familiar nonhuman systems can still generate unfamiliar relational structures. Relations between artificial systems and animals test translation across two comparatively known but differently understood domains. Relations between terrestrial animals and aliens reveal asymmetric familiarity and the danger of relational anchoring. Relations between two alien systems provide a limiting thought experiment in which the interpreter may lack both reliable semantic access and the conceptual resources needed to identify the relevant normative object. None of these cases establishes a moral hierarchy among entity types. Their role is methodological: they progressively remove assumptions that familiar ethical judgment often leaves tacit.

14.3 Normative Emergence without Automatic Obligation

The paper's epistemic analysis does not imply that every reconstructed relation is ethically significant, and ethical significance does not itself imply that any participant is obligated or authorized to act. This separation has been central from Section 7 onward.

A relation can exist without constituting an ethical relation. A norm can emerge and stabilize without thereby being justified. An observer can understand a relation without acquiring standing over it. A participant can be affected without becoming sovereign over the shared condition. An actor can possess

capacity without possessing authority. These distinctions are especially important in heterogeneous settings because the temptation to infer governance from intelligibility is strong. Once an unfamiliar relation has been rendered legible, the interpreter may begin to treat legibility as jurisdiction.

The framework therefore preserves several analytical separations: ethical salience, normative standing, reasons, obligations, permissions, authority, and practical response. Section 10 argued that these should not be collapsed into a single scale of moral urgency. The practical conclusion in a particular case may be inquiry, communication, preservation, assistance, temporary restraint, coordination, intervention, withdrawal, or non-involvement. The framework is not constructed so that every path culminates in intervention.

This is also why the paper abandoned the image of a privileged “third party.” Section 9 treated participants as differently positioned within a relational field. Causal involvement, dependency, control, exposure, request, role, epistemic access, and practical capacity can all matter, but no one of them is an ontological switch that mechanically generates obligation. Normative position is relationally reconstructed and historically variable.

At the same time, decentering does not imply that all interpretations or positions are equivalent. Some participants may control infrastructure, archives, translation interfaces, or resources. Some may be able to revise a shared protocol while others cannot. Some may have better access to the consequences of a relation, and some may be systematically excluded from the conditions under which their interpretation could become visible. A decentered field can therefore contain severe asymmetries of power. The rejection of a privileged center is not the denial of hierarchy; it is a refusal to treat hierarchy as epistemically or normatively self-justifying.

14.4 Shared Normative Objects and Relational Interfaces

One of the paper’s more constructive claims is that heterogeneous normative coordination may require the formation of a partially shared object before substantive normative agreement becomes possible. Participants may disagree not only about whether a relation is permissible, harmful, fair, or obligatory. They may disagree about what relation is being evaluated, which entities count as participants, which time interval matters, or which changes constitute relevant differences.

Section 8 therefore introduced the idea of a cross-interpretive normative interface. Such an interface is not a universal metalanguage and need not produce semantic identity. It is a local, revisable structure through which participants can establish enough correspondence to coordinate, contest, or compare some aspects of the relation. Coordination at the level of signals, procedures, normative objects, or substantive rules can occur without complete consensus.

This possibility is important because it provides an alternative to two extremes. One extreme assumes that one participant’s interpretive system can simply be universalized. The other assumes that difference in interpretive manifolds makes normative coordination impossible. The paper instead leaves room for partial correspondence and local translation, as well as jointly stabilized procedures and historically changing common objects.

Yet interface formation is itself political. The ability to define categories, select evidence, control translation, determine revision procedures, or decide which differences are ignored can concentrate power. A shared interface may therefore coordinate participants while simultaneously reproducing domination. For that reason, coordination and legitimacy remain distinct. Cross-interpretive success cannot be evaluated only by whether interaction becomes smoother or conflict becomes easier to manage.

14.5 Governance without Total Jurisdiction

The governance discussion in Section 11 followed the same restraint. Not every heterogeneous relation is a commons, and not every local relation should be collectivized. Governance questions become more plausible when a relation modifies conditions on which multiple participants depend: shared infrastructures, ecosystems, communication channels, archives, safety environments, or other relational conditions whose alteration has consequences beyond the original interaction.

Even then, affectedness does not automatically confer unlimited authority. The relevant scope of governance may be specific to a particular shared condition. Authority concerning an atmosphere, computational substrate, communication protocol, or common archive need not extend to the participants' internal organization, identity, reproductive practices, or unrelated relationships.

This distinction preserves the possibility of protected locality. It also exposes boundary power. The capacity to define what counts as a shared condition can expand jurisdiction, while defining the shared condition too narrowly can hide structural consequences. Governance boundaries are therefore themselves objects of interpretation, contestation, and revision.

The paper's engagement with commons and polycentric governance should be read in this limited sense. Polycentric architecture can provide useful resources for thinking about multiple sites of knowledge and decision, but it does not resolve the prior epistemic problem of how a shared object becomes intelligible under radical heterogeneity. Nor does it guarantee justice. Institutional plurality can distribute power, reproduce power, or do both at once.

14.6 Re-cognizability and Historical Openness

The final substantive move of the paper concerns time. If concepts, quotient structures, units of analysis, and interpretive manifolds can change historically, then later understanding may involve more than the accumulation of evidence within today's conceptual scheme. Future interpreters may formulate different questions, preserve different distinctions, or reconstruct a relation through dimensions that are not currently available.

Section 12 described this as re-cognizability. The relevant practical concern is not the preservation of one guaranteed path toward a final truth. It is the preservation, where feasible and proportionate, of enough relational richness for later reinterpretation. This includes traces, provenance, contemporaneous classifications, dissenting interpretations, uncertainty, and the history of the classificatory operations through which records were produced.

The problem of quotient lock-in makes the point concrete. An archive that preserves only today's categorical conclusion can destroy the distinctions needed to challenge that conclusion later. A record containing only "aggressor," "victim," and "attack" may be easier to administer than a richer record of signals, temporal sequences, dependencies, transformations, environmental conditions, and interpretive disagreement. Yet the administrative convenience of the quotient can become an epistemic constraint on the future.

This does not imply unlimited preservation. Storage, surveillance, privacy, risk, and institutional capacity impose genuine trade-offs. Re-cognizability is therefore a consideration within situated judgment, not a universal supreme norm. Its importance lies in distinguishing necessary practical closure from unnecessary epistemic closure. A decision may settle what is done now while leaving open how the relation can later be understood.

14.7 The Scope of the Contribution

The paper does not claim that relationality, historical interpretation, care, recognition, capability, structural responsibility, participatory sense-making, epistemic injustice, or polycentric governance are new. Those traditions provide essential parts of the intellectual background. The narrower contribution lies in bringing several problems together around heterogeneous relational reconstruction.

Four candidate contributions are especially important. First, the paper distinguishes the heterogeneity of participants from the epistemic geometry through which their relation is reconstructed. Second, it identifies asymmetric epistemic anchoring as a relation-level problem in which unequal access to participants can shape the object of judgment itself. Third, it distinguishes ordinary uncertainty, conceptual insufficiency, and interpretive-manifold mismatch as epistemically different conditions. Fourth, it argues that cross-interpretive normative coordination may sometimes require the formation of a partially shared normative object rather than merely the comparison of judgments about an already common object.

These claims remain preliminary. The manifold vocabulary requires further formal clarification. The proposed distinctions require empirical testing. The account of obligation after ontological suspension remains incomplete. Cross-interpretive interfaces require a more developed theory of power and representation. Capability-sensitive evaluation under radical heterogeneity remains difficult. Distributed and non-individual forms of agency may require substantial revision of the paper's participant notation. These are not residual details. They mark the limits of what the current argument establishes.

14.8 Closing Perspective

The central difficulty of heterogeneous ethics is often presented as a problem of extension: how far should an existing moral circle, moral status criterion, welfare measure, or legal category be extended beyond familiar humans? This paper has approached the problem from a different direction. Before extension can be evaluated, there may be a problem of reconstruction. Before two judgments can be compared, there may be a problem of constituting a shared object. Before a norm can be applied, there may be a problem of generating the interpretive conditions under which the norm and its object become mutually intelligible.

This does not make ethics disappear into interpretation. Normative structures can become relationally real, organize conduct, distribute resources, constrain action, stabilize expectations, and transform future possibilities. Nor does interpretive mediation make every normative claim equally defensible. Evidence, functional consequences, participant-relative responses, power asymmetries, historical trajectories, and the quality of cross-interpretive interfaces can all support criticism. What the framework rejects is the assumption that these normative objects arrive fully constituted before the relations and interpretive histories through which they become recognizable.

The final methodological posture is therefore one of disciplined openness. Reconstruct the relation without prematurely assigning moral roles. Expose the epistemic geometry through which the reconstruction was produced. Distinguish missing evidence from missing concepts and deeper manifold mismatch. Permit local and partial interfaces without mistaking them for universal translation. Separate normative salience from standing, obligation, permission, and authority. Govern shared conditions without silently claiming total jurisdiction over the participants who inhabit them. Act when practical closure is necessary, but preserve, where possible, the conditions under which that action and the relation it addressed can later be re-recognized.

The broader question remains open: how can normative relations become intelligible, contestable, and practically consequential among beings whose forms of life and interpretive worlds are not given in common? The answer proposed here is not a final norm. It is a research discipline: to treat relations, interpreters, normative objects, and interpretive manifolds as historically generated and mutually implicated, and to make that generative structure visible before claiming that one situated interpretation has become the world for all the others.

References

- [1] Mark Coeckelbergh. Robot rights? towards a social-relational justification of moral consideration. *Ethics and Information Technology*, 12:209–221, 2010.
- [2] Hanne De Jaegher and Ezequiel Di Paolo. Participatory sense-making: An enactive approach to social cognition. *Phenomenology and the Cognitive Sciences*, 6:485–507, 2007.
- [3] Miranda Fricker. *Epistemic Injustice: Power and the Ethics of Knowing*. Oxford University Press, Oxford, 2007.
- [4] Hans-Georg Gadamer. *Truth and Method*. Continuum, London, 2nd revised edition, 2004.
- [5] David J. Gunkel. *The Machine Question: Critical Perspectives on AI, Robots, and Ethics*. MIT Press, Cambridge, MA, 2012.

- [6] David J. Gunkel. *Robot Rights*. MIT Press, Cambridge, MA, 2018.
- [7] Virginia Held. *The Ethics of Care: Personal, Political, and Global*. Oxford University Press, New York, 2005.
- [8] Axel Honneth. *The Struggle for Recognition: The Moral Grammar of Social Conflicts*. MIT Press, Cambridge, MA, 1996. Originally published in German in 1992.
- [9] Christine M. Korsgaard. *Fellow Creatures: Our Obligations to the Other Animals*. Oxford University Press, Oxford, 2018.
- [10] Catriona Mackenzie and Natalie Stoljar, editors. *Relational Autonomy: Feminist Perspectives on Autonomy, Agency, and the Social Self*. Oxford University Press, New York, 2000.
- [11] Martha C. Nussbaum. *Frontiers of Justice: Disability, Nationality, Species Membership*. Belknap Press of Harvard University Press, Cambridge, MA, 2006.
- [12] Martha C. Nussbaum. *Justice for Animals: Our Collective Responsibility*. Simon & Schuster, New York, 2023.
- [13] Elinor Ostrom. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge University Press, Cambridge, 1990.
- [14] Jr. Pohlhaus, Gaile. Relational knowing and epistemic injustice: Toward a theory of willful hermeneutical ignorance. *Hypatia*, 27(4):715–735, 2012.
- [15] Tom Regan. *The Case for Animal Rights*. University of California Press, Berkeley, 1983.
- [16] T. M. Scanlon. *What We Owe to Each Other*. Belknap Press of Harvard University Press, Cambridge, MA, 1998.
- [17] Amartya Sen. *Development as Freedom*. Alfred A. Knopf, New York, 1999.
- [18] Peter Singer. *Animal Liberation: A New Ethics for Our Treatment of Animals*. New York Review, New York, 1975.
- [19] Joan C. Tronto. *Moral Boundaries: A Political Argument for an Ethic of Care*. Routledge, New York, 1993.
- [20] Iris Marion Young. *Responsibility for Justice*. Oxford University Press, New York, 2011.