

A Discussion on Generative Relational Ethics

Norm Emergence, Effective Answerability, and Revisable Universality

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Abstract

Ethical and political theories often evaluate rules after identifying agents, interests, choices, and institutions. Many social relations also participate in the formation of those agents, their capabilities, their interpretive resources, and the channels through which they can respond. This position paper presents Generative Relational Ethics as a preliminary framework for studying norm formation under such dynamic and unequal conditions.

The paper makes four limited proposals. First, it represents norm emergence as a typed process that separates situated responses from institutionally recognized responses. An exact finite witness shows that the same stable norm trace can arise under a response-sensitive rule and a response-insensitive rule. Social stabilization consequently leaves effective answerability and moral authority open. Second, it defines effective answerability through seven path conditions: accessible entry, interpretive legibility, safety, temporal adequacy, causal effect, corrective uptake, and succession durability. These conditions join revisability, non-domination, generative sustainability, reciprocal legibility, and non-closure in a plural process profile.

Third, the paper separates generativity from ethical value. A finite counterexample exhibits system-level repertoire expansion alongside contraction of an affected bearer's viable repertoire. Ethical evaluation therefore needs a declared bearer, domain, distribution, viability standard, externality boundary, and comparison family. A normative bridge certificate then records standing, relevance, value, duty, thresholds, priorities, exceptions, authority, and evidence. Care, capability, discourse, reciprocal justification, and non-domination provide distinct resources for such bridges.

Fourth, the paper refines recursive openness. An existential operator requires one continuing open successor for every challengeable clause. A robust operator requires every admissible effective successor to retain openness. Both operators are monotone and possess greatest fixed points; robust openness is contained in existential openness. A self-abrogation result shows the conflict among unrestricted admissible self-revision, robust successor openness, and classification of a closing successor outside the robust class. The paper concludes with a bridge-relative definition of revisable universality that declares its bearer domain, horizon, protected floor, and meta-review path. Empirical validation, bridge comparison, and institutional design remain future tasks.

Keywords: generative relational ethics; norm emergence; effective answerability; social norms; moral standing; non-domination; recursive openness; self-amendment; revisable universality

Discussion Paper Note

This paper is a preliminary discussion paper intended to share an evolving idea and invite further dialogue, criticism, revision, and independent development.

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Notices

Status. This is a working draft circulated for discussion. Its definitions, propositions, bridge premises, examples, and section numbering remain open to revision.

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Statement on the use of language models. Drafting, literature search, structural review, formal reconstruction, and argumentative criticism were conducted in dialogue with ChatGPT (OpenAI). The author bears responsibility for the claims, definitions, formal constructions, selection of material, argument, and position taken. References included in the bibliography were checked against publisher, journal, university, authoritative digital-edition, or DOI records during preparation.

Companion papers. This paper is the third foundation paper in a proposed sequence on social contract and Generative Relational Ethics. The first reconstructs social contract as a generative relational process. The second distinguishes representation, translation, and radical-heterogeneity limits. The present paper develops the normative foundation through norm emergence, effective answerability, explicit bridge premises, and recursive openness. Subsequent branches address heterogeneously constituted subjects and heterogeneous generative environments.

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1 Introduction

This section states the paper’s motivating problem, bounded research target, central proposal, method, contribution, and sequence. The discussion begins from the difference between evaluating a settled rule and evaluating the relations that form rules, subjects, capabilities, and response channels.

Ethical evaluation often begins with a recognizable configuration. Agents possess interests or reasons. Institutions distribute powers and resources. Rules constrain a known range of conduct. A theory then asks whether the configuration is right, just, legitimate, welfare-promoting, freedom-preserving, or reasonably acceptable. This sequence remains indispensable across many domains.

Some cases add a developmental difficulty. The relation under evaluation helps form the agents who later express preferences, recognize reasons, acquire capabilities, interpret one another, and contest their shared rules. Families, schools, workplaces, political institutions, digital platforms, human–AI relations, and ecological dependencies can all exhibit parts of this pattern. A norm can emerge within a process that simultaneously shapes who can speak, which responses are intelligible, which alternatives appear feasible, and which successors can inherit the capacity to revise the norm.

The previous two papers in this sequence prepare the problem. The first treats social contract as a generative relational process and distinguishes declared fixed-primitives representations from cases in which agency, rule environments, and effective freedom develop together. The second diagnoses representation, translation, and radical-heterogeneity limits in contract-centered norm generation. The present paper supplies a preliminary constructive response. Its target can be stated as follows:

Develop a corrigible ethical framework for norm formation among dynamically constituted and unequally coupled systems, while keeping descriptive emergence, effective response, moral standing, legitimacy, justice, and obligation analytically distinct.

The proposal is called *Generative Relational Ethics*, abbreviated here as GREthic when a compact label is useful. The term names a research programme, not a completed doctrine. Its central object is a coupled relation that can alter the participants’ future capabilities, interpretive resources, response channels, and norm-generating conditions. Its preliminary process core is *effective answerability*: relevant bearers should have meaningful paths through which their responses can be received, interpreted, protected, made consequential, corrected, and carried into successor procedures. The word “should” already invokes a normative premise. This paper therefore exposes a separate bridge from affectedness and structural diagnosis to standing and pro tanto duty.

Three cautions govern the argument. First, a stable norm can arise through learning, coordination, care, consent, exhaustion, repression, or path dependence. Stability provides a descriptive finding under a declared horizon. Second, generativity can sustain flourishing, domination, disease, extraction, or institutional closure. Ethical evaluation must type the bearer, domain, distribution, viability standard, and externalities. Third, procedural revisability can coexist with cosmetic consultation, agenda control, punitive response costs, or self-abrogating successor rules. Openness therefore requires both causal and recursive analysis.

The paper proceeds through philosophical comparison, typed formalization, finite counterexamples, conditional derivation, and adversarial testing. Section 2 locates the proposal beside social-norm theory, discourse ethics, pragmatist inquiry, feminist care and relational autonomy, capability, reciprocal justification, non-domination, and generative justice. Section 3 separates norm emergence

from moral classification. Section 4 develops effective answerability. Section 5 analyzes pathological generativity. Section 6 constructs the normative bridge. Section 7 refines recursive openness. Section 8 develops revisable universality. Sections 9 and 10 state objections and the research programme. Section 11 concludes.

2 Relational Normativity and Antecedent Traditions

This section locates the proposal within verified antecedent traditions and defines its research object. The discussion proceeds from the relational unit of analysis to a comparison of neighbouring theories, followed by a statement of the paper’s limited originality claim.

2.1 The Generative Relational Object

This subsection defines the local object of inquiry and distinguishes it from a dyadic interaction. The definition includes subject development, material conditions, interpretation, response, and succession because each can alter the ethical status of a norm-forming process.

Definition 2.1 (Generative relational process). *A generative relational process is a history-indexed coupling among two or more systems and their environment that can alter at least one participant’s future capabilities, interpretive resources, response channels, viable trajectories, or capacity to participate in later norm formation.*

The definition is diagnostic. A relation can be generative in this sense while producing care, domination, skill, dependency, resilience, depletion, or closure. Generativity identifies the level at which ethical inquiry should look. Moral direction remains an independent evaluation.

The term *system* preserves an open standing domain. Human persons, collectives, institutions, animals, artificial systems, and ecologies require different ontological and evidential accounts. Equal standing, rights, contract capacity, consciousness, welfare, and remedy each require independent arguments. Later bridge premises must state those commitments.

2.2 Neighbouring Theoretical Resources

This subsection reconstructs the resources that most directly constrain the proposal. Table 1 organizes their structural contribution, their caution for GREthic, and the remaining difference. The comparison seeks intellectual continuity without treating proximity as identity.

Bicchieri’s analysis of social norms gives expectations and conditional preferences a central role and explicitly addresses norm emergence, change, inefficiency, and fairness norms [3]. GREthic draws a firm line between this descriptive or explanatory task and the moral classification of the resulting norm. A practice can be socially real and morally abhorrent. Its very stability can increase the cost of challenge.

Habermas develops discourse, democratic legitimacy, rights, and the material conditions of effective participation in a systematic theory of law and democracy [6]. The discourse principle and its legal development provide a major antecedent for affected participation. Critical reconstruction also records a continuing issue: a rich scheme of equal liberty and enabling rights requires premises

Table 1: Antecedent resources and the bounded GREthic contribution

Tradition	Resource for the present inquiry	Constraint on GREthic	Remaining paper-specific task
Social-norm dynamics	Expectations, conditional conformity, emergence, change, and inefficient norms	Social existence and moral authority require separate classifications	Typed response recognition and the stability-answerability witness
Discourse ethics	Affected participation, public justification, rights, and enabling conditions	Actual discourse can reflect exclusion, distortion, and unequal capacity	Effective path conditions across direct, mediated, and heterogeneous response
Pragmatist inquiry	Consequence-sensitive experimentation, fallibility, learning, and revision	Revision requires inquiry institutions and experiential evidence	Recursive successor model and material-difference test
Care and relational autonomy	Dependency, vulnerability, social constitution, responsibility, and sustaining relations	Abstract procedure can miss care labour and unequal relational conditions	Bridge fields for care continuity, capability, safety, and succession
Capability approach	Real opportunities, human diversity, conversion conditions, agency, and well-being	Resources, formal access, and observed choice can misstate effective freedom	Bearer-specific viable repertoires and generativity sign separation
Reciprocal justification	Principles justifiable to persons under reasons that bear on reasonable rejection	Standing and the relevant domain of persons require defence	Answerability paths and bridge-relative extension beyond standard contract capacity
Republican non-domination	Arbitrary or uncontrolled power can constrain freedom without observed interference	Benevolent outcomes can coexist with structural dependence	Agenda, retaliation, and successor-selection power in the process profile
Generative justice	Value circulation, generative production, and community-controlled circulation	Generativity can also characterize exploitative or destructive systems	Pathological-generativity witness and explicit normative bridge

beyond a thin discourse principle [4]. GREthic’s bridge certificate generalizes that lesson. Procedural response gains normative force through substantive standing, value, and duty premises.

Deweyan moral inquiry contributes a different emphasis. Moral judgments enter experience as hypotheses, consequences inform revision, and further inquiry can reopen settled evaluation [2]. GREthic inherits this corrigible orientation. Its recursive model adds a specific institutional question: whether the successor process retains materially effective paths for later correction.

Feminist work on relational autonomy examines how agency, identity, and responsibility arise through social relations [7]. Care ethics and democratic care theory place dependency, care labour, responsibility allocation, equality, and public provision within political analysis [13]. These traditions prevent a response procedure from treating present verbal independence as the sole model of agency. A relation can sustain the very capacities through which later answerability becomes possible.

Sen’s capability approach shifts evaluation toward real opportunities and human diversity, beyond resources or subjective welfare alone [10]. GREthic uses this resource to distinguish formal entry from

effective response capability and to assess bearer-specific viable successors. Scanlon’s contractualism supplies an influential account of principles justifiable to persons [9]. GREthic preserves reciprocal justification as a bridge family while keeping its standing domain open for later analysis.

Pettit’s republican account treats domination as exposure to arbitrary interference, including cases where interference remains unexercised [8]. This modal dimension matters for consultation and revision. A participant can receive favourable decisions while another party retains uncontrolled power over agenda, interpretation, retaliation, and future amendment.

Eglash’s generative justice provides a direct conceptual antecedent through its analysis of generative production and value circulation [5]. GREthic extends the inquiry toward norm emergence, standing bridges, pathological generativity, and recursive openness. The extension is a proposal for dialogue with generative justice and remains the present paper’s construction.

2.3 Research Status and Originality Boundary

This subsection states the manuscript’s epistemic status and limits the originality claim. The aim is a reusable architecture whose components can be revised, absorbed into antecedent theories, or abandoned after systematic comparison.

Four constructions are presented as paper-specific proposals: the seven-part effective-answerability certificate; the typed bridge certificate; the exact stability and pathological-generativity witnesses; and the paired existential and robust recursive-openness operators. The relational orientation, corrigibility, effective freedom, participation, care, reciprocal justification, and non-domination each have substantial antecedents. A later originality review may show that parts of the proposed architecture reproduce existing work under new notation. Such a finding would narrow the contribution and improve the genealogy.

3 Norm Emergence and Moral Classification

This section formalizes a minimal norm-emergence process and separates its descriptive classifications from ethical conclusions. The sequence introduces typed state and response maps, defines stabilization, adds social-norm evidence, and constructs an exact counterexample to the inference from stability to answerability.

3.1 Typed Relational Process

This subsection identifies the elements required to trace norm formation. The central distinction lies between a situated response and the response that an institution recognizes after selection, interpretation, translation, aggregation, or representation.

Let the relational state at time t be

$$Z_t = (x_t, K_t, C_t, N_t, H_t), \tag{1}$$

where x_t is material state, K_t is a capability profile, C_t is a coupling or institutional structure, N_t is a provisional norm, and H_t is relevant history. For each bearer i in the declared set I_t , write

$$r_{i,t} = \rho_i(Z_t, o_{i,t}, u_{i,t}), \quad (2)$$

$$\hat{r}_{i,t} = J_{i,t}(r_{i,t}; Z_t), \quad (3)$$

$$Z_{t+1} = \mathcal{U}(Z_t, (\hat{r}_{i,t})_{i \in I_t}, e_t). \quad (4)$$

The terms $o_{i,t}$, $u_{i,t}$, and e_t denote situated observation, attempted intervention or expression, and exogenous disturbance. The map $J_{i,t}$ can transmit, translate, aggregate, distort, delay, or suppress a response. Equations (2)–(4) therefore support a trace of where response influence enters and where it is lost.

The decomposition also accommodates proxy response. A representative can produce a mediated path when direct expression is unavailable. Such a path requires separate evidence of authority, fidelity, plurality, contestability, displacement, and revision. Equality between the representative’s expression and the affected bearer’s response remains an empirical and interpretive claim.

3.2 Descriptive Stabilization

This subsection defines a bounded persistence predicate and identifies the additional evidence required for a social-norm classification. The method uses a declared metric, tolerance, and horizon, followed by expectation and practice evidence.

Definition 3.1 (Descriptive stabilization). *For a discrepancy d_N , tolerance ε , horizon H , and initial time t_0 , define*

$$\text{Stable}_{\varepsilon, H}(N; t_0) \iff \max_{t_0 \leq t < t_0 + H} d_N(N_{t+1}, N_t) \leq \varepsilon. \quad (5)$$

Equation (5) classifies a trace. A social-norm finding also needs evidence about reference groups, empirical expectations, normative expectations, conditional conformity, sanction, coordination, or practical uptake. Bicchieri’s framework demonstrates why a repeated behavioural pattern and a social norm form separate empirical targets [3].

Moral classification enters later. Five predicates should remain visible:

1. *social existence*: the relevant expectation and practice structure is present;
2. *effective answerability*: relevant responses can materially affect the process;
3. *legitimacy*: an institution has justified authority under a declared political standard;
4. *justice*: distributions, standing, relations, and institutions satisfy a defended conception of justice;
5. *moral authority*: the norm supplies a justified moral reason or obligation.

The predicates can support one another under additional premises. Their separation prevents a socially entrenched norm from acquiring moral authority through persistence alone.

3.3 Stability and Response Sensitivity

This subsection supplies an exact finite witness separating stable traces from answerability. The controlled contrast changes the situated response while holding the declared rule maps fixed.

Proposition 3.2 (Stable-trace underidentification). *There exist two norm-update processes that produce the same perfectly stable observed trace and differ under a controlled response intervention.*

Proof. Let $N_t, r_t \in \{0, 1\}$, initialize $N_0 = 0$, and define

$$\mathcal{U}_A(N_t, r_t) = r_t, \quad \mathcal{U}_B(N_t, r_t) = 0.$$

Along the observed history $r_t = 0$, both processes produce $N_t = 0$ and satisfy Equation (5) with $\varepsilon = 0$. Under $do(r_t = 1)$, process A produces $N_{t+1} = 1$, while process B produces $N_{t+1} = 0$. The observed trace therefore leaves the response sensitivity of the update and effective answerability unidentified. $\square$

The witness is deliberately small. It applies to a common inferential mistake: agreement, low conflict, high compliance, or long persistence can appear in an answer-sensitive process and in a process that would ignore dissent if dissent became visible. Empirical analysis needs controlled variation, natural experiments, process tracing, or another defended causal design.

Coercive stability forms a substantive extension. Retaliation can suppress $r_{i,t}$ before institutional recognition. Dependency can make the cost of expression prohibitive. Adaptive preference can reshape which alternatives a bearer can imagine or safely endorse. Agenda control can prevent a response from becoming relevant to $J_{i,t}$. Each mechanism can stabilize a norm while weakening the process by which the norm could be challenged.

4 Effective Answerability

This section develops the paper’s central process criterion. The discussion defines a path-based certificate, distinguishes direct and mediated response, specifies causal effect and correction, and places answerability within a plural profile whose coordinates retain independent meanings.

4.1 Response-Path Certificate

This subsection defines effective answerability through seven conditions that span entry, interpretation, protection, timing, effect, correction, and succession. The conjunctive form blocks several familiar procedural false positives.

For a response path $p \in \mathcal{P}_i(C)$, define

$$q(p) = (a_p, \ell_p, s_p, t_p, e_p, k_p, h_p) \in [0, 1]^7, \quad (6)$$

where the coordinates represent accessible entry, interpretive legibility, safety and protection from retaliation, temporal adequacy, causal effect, corrective uptake, and succession durability. Each coordinate needs a domain-specific operational definition. A high value always denotes stronger performance under the declared scale.

Table 2: Effective-answerability coordinates and diagnostic obligations

Coordinate	Structural function	Characteristic false positive	Required evidence or repair
Entry	permits initiation or authorization	formal portal with prohibitive cost	effective access, support, and alternative channels
Legibility	preserves target-relevant response	fluent translation that erases salient distinctions	plural interpreters, fidelity tests, correction
Safety	protects response and livelihood	participation under retaliation risk	non-retaliation evidence, independence, remedy
Timing	matches decision and harm horizons	response arrives after irreversible commitment	early warning, pause, prospective representation
Effect	changes a relevant outcome or rule condition	consultation with invariant decisions	controlled response contrast or causal process trace
Correction	repairs error and misrecognition	one-time hearing fixes the institutional record	appeal, iterative interpretation, reasons and response
Succession	carries response capacity forward	present concession closes future amendment	durable authority, successor rights, recursive audit

Definition 4.1 (Effective answerability). *Given a coordinate threshold vector τ , bearer i has effective answerability in constitution C when*

$$\text{Ans}_i(C; \tau) = 1 \iff \exists p \in \mathcal{P}_i(C) \quad q_j(p) \geq \tau_j \quad \text{for every coordinate } j. \quad (7)$$

Accessible entry asks whether the bearer can initiate or authorize a response. Legibility asks whether relevant distinctions survive interpretation. Protection asks whether expression avoids punitive dependence or retaliation. Temporal adequacy asks whether the response arrives before irreversible or critical change. Causal effect asks whether a relevant contrast can alter the rule, its implementation, or its conditions. Corrective uptake asks whether misinterpretation and error can be repaired. Succession durability asks whether the path remains available to later bearers and later challenges.

Table 2 records the corresponding false positives and evidential repairs. Its rows are diagnostic obligations, not measurements supplied by the framework.

4.2 Mediated and Proxy Answerability

This subsection extends the certificate beyond direct verbal participation. The method treats mediation as a path with additional authority and fidelity conditions, preserving both its necessity and its paternalistic risks.

Infants, persons with some cognitive or communicative disabilities, animals, future persons, ecosystems, and artificial systems can lack direct access to a human deliberative forum for different reasons. Their heterogeneity also makes behavioural interpretation uncertain. A representative, caregiver, advocate, scientist, guardian, trustee, model, sensor network, or institutional office can create a response path. The path’s quality depends on at least six further questions:

1. Which source grants authority, and how is that authority limited?
2. Which evidence supports fidelity to the bearer or protected relation?

3. Which plural representatives and interpretations remain available?
4. Which parties can contest, correct, or remove the representative?
5. Which direct response routes can displace the proxy when capacity changes?
6. Which successor procedure revises the representation arrangement?

Proxy agreement supplies limited evidence. A proxy can sincerely endorse a decision while the affected bearer’s counterfactual response would have changed the decision under another representation process. The three-limit analysis in the companion paper therefore remains active inside GREthic: representation, translation, and identification can each weaken a path.

4.3 Causal Effect and Cosmetic Response

This subsection specifies the causal content of response effectiveness. The central contrast compares institutional trajectories under distinct admissible responses while holding the relevant process specification fixed.

For path p , response values r, r' , and a declared institutional target $Y_{t:H}$, define the response sensitivity

$$\Delta_{i,p}(r, r') = d_Y(Y_{t:H}(do(p(r))), Y_{t:H}(do(p(r')))). \quad (8)$$

A positive value under a target-relevant contrast supplies evidence of effect. A zero estimate can reflect an inert path, an insensitive response contrast, a poor target, an inadequate horizon, or statistical uncertainty. The diagnosis therefore includes the intervention and measurement design.

Cosmetic response occurs when entry and visible consultation increase while the target-relevant effect, correction, or succession coordinates remain near zero. Institutions can produce extensive records, hearings, surveys, and participation metrics under this pattern. Equation (8) redirects attention from procedural volume to causal consequence.

4.4 Plural Process Profile

This subsection embeds answerability within a multi-dimensional process audit. The vector form preserves independent failure modes and requires explicit normative work before aggregation.

Define

$$\Pi_t = (\text{Ans}_t, \text{Rev}_t, \text{NonDom}_t, \text{GenSust}_t, \text{Leg}_t, \text{NonCl}_t). \quad (9)$$

The coordinates denote effective answerability, revisability, non-domination, reciprocal generative sustainability, reciprocal legibility, and non-closure under uncertainty. Componentwise comparison is the default. A scalar score would need weights, compensation rules, vetoes, thresholds, and an authority for choosing them.

This profile also clarifies the status of answerability. A highly answerable process can still distribute basic capabilities unjustly. A non-dominating process can still neglect care. A revisable process can

still impose severe irreversible harm before revision arrives. A generatively sustainable process can still exclude bearers under an undefended standing rule. The dimensions organize inquiry while a normative bridge supplies value and priority.

5 Generativity and Ethical Value

This section prevents a central category error: treating generativity as a positive scalar value. The discussion types generativity by bearer and domain, constructs a sign-reversal witness, and develops substantive cases of pathological generativity, distribution, and externality.

5.1 Typed Generative Repertoires

This subsection defines the repertoire comparison used in the ethical audit. The definition distinguishes a whole system’s reachable successors from the viable successors of an affected bearer.

Let $\mathcal{V}_{S,t}$ be the system-level repertoire of reachable trajectories at time t , and let $\mathcal{V}_{i,t}$ be the subset of viable trajectories effectively reachable by bearer i . Viability can include survival, capability, integrity, care, ecological thresholds, or another declared standard. For finite repertoires, write

$$g_X(t) = |\mathcal{V}_{X,t+1}| - |\mathcal{V}_{X,t}|. \quad (10)$$

Cardinality is a deliberately weak illustration. Rich applications can use weighted reachability, option security, duration, diversity, recovery, conversion conditions, and path quality. Sen’s emphasis on real opportunity supports this shift from nominal possibility to effective capability [10].

5.2 System–Bearer Sign Reversal

This subsection gives an exact counterexample to generativity maximization. The construction uses finite repertoires and evaluates changes at two levels.

Proposition 5.1 (Generativity sign separation). *System-level repertoire expansion can coexist with contraction of an affected bearer’s viable repertoire.*

Proof. Take

$$\mathcal{V}_{S,t} = \{a, b\}, \quad \mathcal{V}_{S,t+1} = \{a, b, c\},$$

and

$$\mathcal{V}_{i,t} = \{p, q\}, \quad \mathcal{V}_{i,t+1} = \{p\}.$$

Equation (10) gives $g_S(t) = +1$ and $g_i(t) = -1$. Hence an increase in aggregate reachable variety leaves the direction of bearer-level viable generativity undetermined. $\square$

The same logical profile admits many mechanisms. An extractive organization can expand product lines while workers lose exit, learning, or bargaining routes. A platform can increase total generated content while contributors lose provenance, visibility, or future opportunity. An empire can expand its administrative and productive repertoire while subordinated communities lose language, land, authority, or institutional continuity. The counterexample supplies a structural possibility. Each substantive diagnosis requires historical and empirical evidence.

5.3 Pathological Generativity

This subsection develops the ethical significance of generativity that sustains destructive or dominating processes. The analysis separates reproductive success, affected-bearer viability, distribution, and moral evaluation.

Tumours and pathogens can grow, adapt, reproduce, and reshape environments. Authoritarian institutions can train successors, reproduce loyalty, elaborate rules, and absorb opposition. Exploitative relations can develop new techniques, markets, dependencies, and legitimating narratives. Each process can exhibit high generative capacity relative to its own continuation.

These examples block three shortcuts. First, persistence has a bearer: the continuing entity can be a person, practice, organization, parasite, or dominating structure. Second, novelty has a distribution: one system's new routes can consume another system's viable conditions. Third, self-extension has externalities: future expansion can export care burdens, ecological loss, risk, and closure to parties outside the measured boundary.

Claim 5.2 (Typed ethical relevance). *Generativity is ethically relevant when it changes valued capabilities, standing-bearing relations, vulnerability, domination, viable conditions, or the distribution of future norm-generating power. Its moral direction follows from those typed effects and the governing normative bridge.*

The claim preserves Eglash's attention to generative production and value circulation while adding a pathology screen [5]. Generativity becomes an object of ethical evaluation and an explanatory mechanism. A maximizing principle would require a value-bearing unit, an aggregation rule, distributional constraints, protected floors, externality boundaries, and priority principles. The present framework supplies none of these by default.

6 Normative Bridge Architecture

This section states the normative transition that process descriptions leave open. The discussion defines a bridge certificate, compares five bridge families, proposes a conditional answerability principle, and marks the remaining conflicts among standing, value, priority, and emergency rules.

6.1 Bridge Certificate

This subsection turns implicit moral premises into an inspectable record. The certificate states who counts, which relation matters, which value is engaged, which duty follows, and which authority supports the interpretation.

Definition 6.1 (Normative bridge certificate). *A normative bridge is a typed record*

$$B = (\text{Bear}, \text{Stand}, \text{Rel}, \text{Val}, \text{Duty}, \text{Thresh}, \text{Priority}, \text{Except}, \text{Auth}, \text{Evid}). \quad (11)$$

The bearer field declares the possible units of standing. The standing field states the sufficient or defeasible criterion. The relevance field connects a decision to a bearer. Value and duty state the evaluative basis and practical requirement. Threshold and priority handle degree and conflict. Exceptions identify conditions such as incapacity, emergency, trivial burden, or competing rights.

Authority states who can interpret and revise the bridge. Evidence records the warrant for factual premises and application.

A complete certificate can retain plural alternatives. For example, a standing field can contain competing sentience, capability, relationship, vulnerability, agency, or ecological-integrity criteria. The record then marks the verdict as unresolved or robust across the alternatives. Explicit plurality is preferable to a single hidden premise.

6.2 Bridge Families

This subsection compares normative resources that can populate the bridge. The comparison emphasizes complementary functions and preserves disagreements about standing, impartiality, partiality, duty, and institutional form.

Discourse and affected participation connect validity or legitimacy to reason-giving among those affected, together with rights and material enabling conditions [6, 4]. This family supports access, legibility, correction, and public justification. Its standing and communication conditions require supplementation where subjects lack ordinary discursive capacity.

Care and vulnerability connect dependency, need, sustaining labour, responsibility, and unequal relational position [13]. This family supports safety, temporal adequacy, continuity, and duties toward subjects whose response capacities depend on care. It also raises conflicts between partial relationships, public allocation, caregiver burden, and equal standing.

Capability and effective freedom evaluate what bearers can actually do and be under personal, social, and environmental conversion conditions [10]. This family supports effective entry, response capability, viable successor repertoires, and attention to human diversity. The selection, weighting, and extension of capabilities beyond persons remain substantive tasks.

Reciprocal justification treats principles as owing justification to persons who bear their burdens [9]. This family supports reason-giving, individual complaint, and limits on aggregation. GREthic's heterogeneous standing domain can exceed the direct scope of a person-centred contractualism, so translation and representation remain open.

Non-domination evaluates exposure to arbitrary or uncontrolled power, including unexercised power [8]. This family supports protection from retaliation, agenda control, dependency, and successor capture. It also needs a substantive account of which interests, controls, and institutions render power non-arbitrary.

The bridge families can converge in some cases. A worker whose employer controls expression, exit, and future opportunity can have a capability complaint, a domination complaint, a care or dependency complaint, and a justification complaint. Convergence can strengthen a pro tanto conclusion. Conflict also remains possible. Care continuity can favour temporary limits on exit or revision. Equal discursive procedure can burden subjects with unequal response capabilities. A capability-expanding policy can concentrate uncontrolled institutional power. The certificate preserves these tensions.

6.3 Conditional Answerability Principle

This subsection states the paper’s main normative proposal in conditional form. Its force comes from the declared bridge, while feasibility, conflict, proportionality, and remedy remain further stages.

Let $D(i, a, C)$ be a structural diagnosis for bearer i , action or rule a , and constitution C .

Claim 6.2 (Bridge-relative answerability). *For a defended bridge B , the following is a candidate pro tanto rule:*

$$\begin{aligned} & \text{Stand}_B(i) \wedge \text{Rel}_B(i, a, C) \wedge \text{Burden}_B(D(i, a, C)) \wedge \text{FeasibleAlt}_B(a, C) \\ & \implies O_B^{\text{pro tanto}}(\text{ResponseOrRepair}(i, a, C)). \end{aligned} \quad (12)$$

The rule says that a bearer satisfying the bridge’s standing criterion, facing a relevant and sufficiently serious burden, has a pro tanto claim to an effective response path or repair when a feasible institutional alternative exists. The bridge determines burden, seriousness, feasibility, and the form of response or repair.

The conditional form performs essential epistemic work. A causal relation alone can be too broad for standing. Affectedness can range from trivial contact to irreversible capability loss. A response path can conflict with privacy, care, safety, ecological thresholds, or the standing of others. Pro tanto force can be outweighed. Repair can require representation, restoration, compensation, capability support, power redistribution, or prospective protection.

Open Problem 6.3 (Bridge convergence and conflict). *Identify domains in which care, capability, discourse, reciprocal justification, and non-domination support the same answerability conclusion; classify cases in which they diverge; and specify justified priority rules.*

7 Recursive Openness

This section formalizes the succession problem inside revisability. The discussion defines bridge-relative effective successors, distinguishes existential from robust openness, proves monotonicity and greatest-fixed-point results, and limits the ethical interpretation of the mathematics.

7.1 Effective Successor Relation

This subsection defines the transition relation used by the recursive model. The relation screens syntactic amendments, inert consultation, retaliatory routes, and successor arrangements that immediately extinguish the revised capacity.

Let $\mathbb{C}$ be a declared universe of norm-generating constitutions or procedures, and let $c \in C$ be a challengeable clause or commitment. Relative to bridge B , define

$$\text{Succ}_B(C, c) = \{C' \in \mathbb{C} : E_B(C, c, C')\}. \quad (13)$$

The predicate E_B requires an accessible response route, recognized standing, causal consequence, material difference, sufficient safety, and succession durability. Admissibility can also include rights,

care continuity, reliance interests, evidence thresholds, and emergency constraints. An identity amendment fails material difference. A punitive amendment fails protection. A reform that grants one challenge and abolishes all future challenge fails successor durability under a sufficiently strong bridge.

The bridge-relative definition prevents fixed-point mathematics from supplying its own ethical semantics. The map specifies recursion only after a normative and institutional account identifies effective successors.

7.2 Existential and Robust Operators

This subsection separates two meanings of continuing openness. The first requires at least one open route for every clause. The second requires every admissible effective route to preserve openness.

For $X \subseteq \mathbb{C}$, define

$$T_B^\exists(X) = \{C : \forall c \in C, \text{Succ}_B(C, c) \cap X \neq \emptyset\}, \quad (14)$$

$$T_B^\forall(X) = \{C : \forall c \in C, \text{Succ}_B(C, c) \neq \emptyset \text{ and } \text{Succ}_B(C, c) \subseteq X\}. \quad (15)$$

Existential openness is permissive. A constitution can admit several closing successors as long as one continuing open successor remains available for each clause. Robust openness is demanding. Every successor already classified as admissible and effective must remain inside the selected open class.

Proposition 7.1 (Operator monotonicity). *Both operators in Equations (14)–(15) are monotone under set inclusion.*

Proof. Take $X \subseteq Y$. If every clause has a successor in X , it has a successor in Y . Hence $T_B^\exists(X) \subseteq T_B^\exists(Y)$. If every successor set is nonempty and contained in X , it is also contained in Y . Hence $T_B^\forall(X) \subseteq T_B^\forall(Y)$. $\square$

7.3 Coinductive Openness Classes

This subsection derives the recursive classes and their inclusion relation. The method applies the complete-lattice fixed-point theorem and then uses the post-fixed-point characterization of the greatest fixed point.

The powerset $\mathcal{P}(\mathbb{C})$, ordered by inclusion, is a complete lattice. Tarski's fixed-point theorem therefore applies to the monotone operators [12]. Define

$$\mathcal{O}_B^\exists = \nu T_B^\exists, \quad \mathcal{O}_B^\forall = \nu T_B^\forall. \quad (16)$$

Proposition 7.2 (Openness-strength inclusion). *Under Equations (14)–(16),*

$$\mathcal{O}_B^\forall \subseteq \mathcal{O}_B^\exists. \quad (17)$$

Proof. Let $X = \mathcal{O}_B^\forall$. Fixed-point membership gives $X = T_B^\forall(X)$. Every constitution in X therefore has, for every clause, at least one successor inside X . Thus $X \subseteq T_B^\exists(X)$. Every post-fixed set of $T_B^\exists$ lies inside its greatest fixed point, yielding $X \subseteq \mathcal{O}_B^\exists$. $\square$

For finite $\mathbb{C}$, initialize $X_0 = \mathbb{C}$ and iterate $X_{k+1} = T(X_k)$. The sequence descends and stabilizes after finitely many strict removals. Its stable value is the greatest fixed point. Infinite universes can require transfinite approximation or additional continuity assumptions. Finite computational audits should therefore state the universe of constitutions and the excluded transitions.

7.4 Mathematical and Ethical Status

This subsection limits the interpretation of the fixed-point result. The mathematics guarantees existence of recursively defined classes under a declared successor relation; ethical authority remains located in the bridge and institutional semantics.

The fixed point says which procedures reproduce a chosen form of openness. It leaves at least four normative issues unresolved. First, B determines who receives standing. Second, E_B determines which successors count as effective and admissible. Third, the distinction between existential and robust openness expresses a political choice about closing successors. Fourth, control over the successor menu can remain concentrated even when the formal class is open.

The result is therefore a formal audit tool. It detects recursion, closure, and dependence on admissibility. Ethical evaluation of openness and a complete account of legitimate constitutional change remain independent tasks.

8 Revisable Universality

This section examines the relation between universal scope, self-legislation, and recursive revision. The sequence derives the self-abrogation trilemma, compares institutional responses, defines bridge-relative revisable universality, and specifies emergency safeguards.

8.1 Self-Abrogation Structure

This subsection states the conflict created by a successor that uses an authorized revision path to abolish future revision. The derivation separates unrestricted admissibility, robust persistence, and the classification of the closing successor.

Let $C_\perp$ abolish effective future revision for a protected challenge c^* . Consider

$$\begin{aligned} U : C_\perp &\in \text{Succ}_B(C, c^*), \\ P : C &\in \mathcal{O}_B^\forall, \\ A : C_\perp &\notin \mathcal{O}_B^\forall. \end{aligned}$$

Proposition 8.1 (Self-abrogation trilemma). *The three requirements U , P , and A cannot hold together. More precisely,*

$$U \wedge A \implies C \notin \mathcal{O}_B^\forall, \quad U \wedge P \implies C_\perp \in \mathcal{O}_B^\forall. \quad (18)$$

Proof. Robust openness requires the complete admissible successor set for c^* to lie inside $\mathcal{O}_B^\forall$. If that set contains $C_\perp \notin \mathcal{O}_B^\forall$, then C fails robust openness. Conversely, if C is robustly open and $C_\perp$ is an admissible effective successor, the universal-successor clause places $C_\perp$ inside the robust class. $\square$

The formal tension belongs to a wider literature on self-amendment and rules for changing rules. Suber analyzes self-application, regress, legal validity, and change [11]. Albert examines amendment-rule entrenchment and the intertemporal design of constitutional amendment [1]. GREthic transfers the structural problem to answerability: a present procedure can authorize a successor that removes the conditions under which future affected parties can respond.

8.2 Institutional Response Families

This subsection compares four responses to the trilemma. Table 3 records their retained value, principal risk, and required justification.

Existential openness prioritizes availability. Its adequacy depends on who can reach the open route and who controls the choice among successors. Robust openness prioritizes persistence. Its adequacy depends on a justified admissibility boundary. A protected floor places standing, safety, challenge, or basic rights beyond ordinary amendment while providing a distinct path for reviewing interpretation and application. Accepted closure risk gives current participants wider constituent authority while exposing future participants to loss of answerability.

Each family can be appropriate under some bridge and horizon. The framework therefore resists a single universal design recommendation. It requires the institution to state which value it protects, whose future authority it constrains, which closing risk it accepts, and how later affected parties can contest the choice.

8.3 Bridge-Relative Construction

This subsection defines a bounded form of revisable universality. Universal scope applies across a declared bearer domain; revisability applies through effective successors; a protected floor preserves current answerability; and meta-review subjects the floor’s interpretation and emergency uses to a distinct procedure.

Let $b = (B, D, H, k)$ declare a bridge, bearer domain, institutional horizon, and recursive depth.

Definition 8.2 (Bridge-relative revisable universality).

$$\begin{aligned} \text{RU}_b(C) \iff & \text{Scope}_B(C; D) \wedge \text{EqualStanding}_B(C; D) \wedge \text{Open}_{B,k}^\exists(C) \\ & \wedge \text{ProtectedFloor}_B(C; H) \wedge \text{MetaReview}_B(C; H). \end{aligned} \quad (19)$$

Scope declares which bearers fall under the principle. Equal standing declares the relevant equality, which can concern consideration, response, protection, or another bridge-specific relation. Finite-depth openness requires materially effective challenge routes. The protected floor preserves the conditions of answerability over horizon H . Meta-review permits challenge to the floor’s interpretation, evidential basis, institutional operation, and emergency use.

Table 3: Recursive-openness response families and their normative burdens

Response family	Retained value	Principal risk	Required justification
Existential openness	at least one continuing open route per clause	closing routes can dominate the feasible menu	distribution of selection power and effective accessibility
Robust openness	every admissible effective successor preserves openness	admissibility constraints can conceal entrenchment	authority, scope, and revision of admissibility
Protected floor	standing, safety, and challenge survive ordinary amendment	present authors constrain future self-legislation	rights, care, vulnerability, intertemporality, and meta-review
Accepted closure risk	future constituents retain broad self-amendment power	temporary majorities can extinguish later answerability	democratic authority, warning, supermajority, delay, restoration

Equation (19) is universal only across D under B . It is revisable only through the specified paths and depth. The construction openly depends on external normative semantics. It therefore avoids presenting a fixed point as self-validating legislation.

The protected floor also requires restraint. A floor can become a device for preserving the authority of its authors. Meta-review can relocate closure to a higher level. Institutional analysis should trace who appoints reviewers, who sets admissibility, which evidence can reopen the floor, and which bearers remain outside the review channel.

8.4 Emergency Transitions

This subsection addresses temporary limits on ordinary answerability during acute threats. The approach treats emergency authority as a bridge-specific transition with expiry, renewal, residual response, restoration, and loss accounting.

An emergency rule should declare at least six elements: a public trigger, a competent authority, a duration, an independent renewal burden, a residual challenge path, and a restoration plan. A seventh element records capabilities, rights, care relations, ecological conditions, and response paths lost during the closure. The record permits later repair and institutional learning.

Emergency necessity can justify a temporary narrowing of ordinary procedure. Its justification remains *pro tanto* and time-indexed. Repeated renewal, strategic trigger definition, weak residual challenge, and absent restoration can convert emergency transition into ordinary closure. Recursive audit should therefore include the successor reached after emergency powers expire.

9 Objections and Counterconditions

This section tests the proposal against procedural moralism, adaptive stability, discursive exclusion, standing inflation, regress, and theoretical duplication. Each objection identifies a condition under which the framework requires narrowing, supplementation, or abandonment.

9.1 Procedural Sufficiency

This subsection examines the strongest internal objection: an effectively answerable process can still produce severe injustice. The response preserves answerability as a candidate audit dimension and limits its claim to independent normative sufficiency.

A cruel rule can be openly debated, amended, and supported. A majority can retain effective voice while a minority bears concentrated harm. A community can sustain reciprocal legibility inside its boundary while exporting risk and depletion. These cases show why Equation (9) remains a vector and why Equation (12) requires standing, burden, priority, and exception premises.

The present paper therefore advances a modest position. Effective answerability is a strong candidate requirement when a defended bridge grants standing to a bearer materially shaped by a norm-generating process. Its general necessity can face counterexamples involving privacy, incapacity, acute emergency, trivial effects, or conflicting rights. Its sufficiency would require a much richer theory.

9.2 Adaptive Response and Epistemic Power

This subsection examines response formation under domination, dependency, and limited imagination. The response adds counterfactual capability, independent interpretation, and power analysis to expressed preference.

A bearer can endorse a relation after long exposure has narrowed perceived alternatives. A worker can remain silent because livelihood depends on the decision-maker. A community can accept translation categories supplied by an external institution. An artificial system can generate responses shaped by training, reward, and interface constraints. Present expression remains evidence, while its interpretation depends on formation history and feasible alternatives.

GREthic should therefore compare expressed response, effective option sets, dependency structure, developmental history, and controlled changes in response conditions. Senian capability and relational-autonomy traditions are especially important here [10, 7]. Pettit’s modal account adds the power another party retains even when present interference is limited [8].

9.3 Heterogeneous Response and Standing

This subsection addresses bearers whose responses differ from ordinary human discursive participation. The response preserves plural evidence and treats standing as an independent bridge question.

Behavioural, physiological, ecological, developmental, represented, computational, and refusal-based responses can enter an answerability audit. Their meanings depend on model sets, interventions, translation, and uncertainty. A proxy path can extend response while also concentrating interpretive authority. The downstream heterogeneous-subject paper must therefore analyze standing evidence, translation direction, model underdetermination, and proxy accountability in greater depth.

Affectedness alone can also inflate standing. Every action enters many causal chains. Equation (11) requires a standing criterion, relevance relation, and threshold precisely to block automatic promotion from causal contact to full moral claim. Different bridges may grant consideration, precaution, representation, rights, or remedy at different levels.

9.4 Recursive Regress and Institutional Capture

This subsection examines the possibility that meta-review merely shifts closure upward. The response treats recursive depth as a declared design parameter and audits control at every represented level.

A review body can control the interpretation of a protected floor. A court can be captured. A supermajority rule can entrench incumbents. An amendment rule can be altered through informal practice. A higher review path can produce another level requiring review. Recursive notation reveals this structure while institutional design decides where to stop, distribute, rotate, or reopen authority.

The bounded horizon and recursive depth in Equation (19) make this stopping point explicit. The choice requires justification through risk, cost, capability, care, intertemporality, and democratic authority. Suber and Albert demonstrate the depth of self-amendment and entrenchment problems in legal settings [11, 1].

9.5 Theoretical Distinctness

This subsection tests whether GREthic supplies an independent research programme or a loose combination of established theories. The response narrows the contribution to architecture, formal separations, and cross-domain questions.

Discourse ethics already centers participation and justification. Pragmatism already centers inquiry and revision. Care ethics and relational autonomy already center dependency and socially constituted agency. Capability already centers real opportunity. Republicanism already centers structural power. Generative justice already centers generative production and circulation.

GREthic earns a distinct role only if its joint focus on subject formation, typed response recognition, pathological generativity, explicit bridge certificates, and recursive successor openness supports questions or diagnoses that remain obscured when these resources are applied separately. Systematic comparison can show that this condition fails. In that case, the responsible revision would present GREthic as an integrative audit vocabulary or distribute its components back into their antecedent traditions.

10 Research Programme

This section converts the preliminary framework into a staged research programme. The agenda separates philosophical defence, empirical operationalization, institutional comparison, formal refinement, and two heterogeneity branches.

10.1 Philosophical Development

This subsection identifies the arguments required before stronger normative claims become available. The priority lies in bridge premises, conflicts, and standing domains.

The first task is a comparative bridge analysis. Care, capability, discourse, reciprocal justification, rights, practical reason, and non-domination can support answerability through different routes.

Their bearer domains, thresholds, priorities, exceptions, and institutional implications should be reconstructed from primary texts and tested on shared cases.

The second task is a standing taxonomy. Causal affectedness, vulnerability, sentience, agency, capability, relationship, constitutive contribution, ecological integrity, and future dependence may ground different levels of consideration. The taxonomy should preserve distinctions among moral standing, justice relevance, representation, rights, precaution, and remedy.

The third task is a theory of generative pathology. It should distinguish reproduction, development, expansion, resilience, capture, parasitism, domination, depletion, and closure. The system–bearer sign reversal supplies one minimal result. Richer arguments need value, distribution, and counterfactual baselines.

10.2 Empirical and Institutional Development

This subsection identifies observable implications and comparative designs. The objective is to turn path coordinates and closure mechanisms into measurable, contestable research objects.

Empirical studies can intervene on response channels, interpretation, protection, timing, and agenda access. Outcomes should include decision change, reason revision, correction, retaliation, option security, and successor rights. Process tracing can identify where $r_{i,t}$ becomes $\hat{r}_{i,t}$ and where institutional selection alters it.

Institutional comparison can examine citizen assemblies, workplace voice, care planning, disability representation, environmental trusteeship, platform governance, scientific advisory systems, and constitutional amendment. The comparison should report response pathways and bridge assumptions, including who authorizes representatives and who controls admissible successors.

10.3 Formal Development

This subsection states the next mathematical obligations. The objective is to extend the current exact results while preserving their normative and empirical boundaries.

Priority work includes stochastic response recognition, partial identification, strategic consultation, threshold sensitivity, networked successor control, fast–slow temporal mismatch, and emergency transitions. Recursive models should add the distribution of amendment power and distinguish formal successor availability from effectively reachable succession.

The fixed-point analysis also needs infinite-state conditions. Transfinite approximation, continuity assumptions, and computational restrictions should be stated. Formal verification can test a declared constitution for existential or robust openness, while the bridge and successor semantics remain subject to philosophical and empirical audit.

10.4 Heterogeneity Branches

This subsection records the two papers that depend on the present foundation. The branches share effective answerability and bridge requirements while developing different ethical objects.

The first branch concerns ethics across heterogeneously constituted subjects. It will examine animal, possible extraterrestrial, artificial, disabled, collective, and otherwise differently constituted subjects

through standing, directional translation, proxy representation, and response uncertainty. Its central risk is anthropomorphic projection combined with silence-as-consent.

The second branch concerns heterogeneous generative environments. It will examine normative transposition across forests, oceans, organizations, schools, and possible extraterrestrial ecologies. Its central risk is transfer of a rule whose source-environment success fails under a target ecology's temporal scale, memory, critical conditions, and co-evolution. Prospective answerability and critical-condition protection will be central.

11 Conclusion

This section consolidates the paper's limited contributions and identifies the conditions for revision. The conclusion follows the argument's four-part structure: emergence, answerability, bridge, and recursive openness.

Generative Relational Ethics begins from a demanding but common possibility: the relations governed by a norm can participate in forming the subjects, capabilities, interpretations, and response channels through which that norm is later judged. Ethical inquiry then needs more than a snapshot of settled agents and rules. It needs a trace of response formation, institutional recognition, power, consequence, correction, and succession.

The paper has separated norm stabilization from effective answerability through an exact finite witness. It has defined answerability through entry, legibility, safety, timing, effect, correction, and succession. It has placed that certificate inside a plural process profile. It has also shown that system-level generativity can expand while an affected bearer's viable repertoire contracts. These results block automatic promotion from stability, procedure, or generativity to ethical value.

The normative bridge is therefore central. Standing, relevance, value, duty, thresholds, priorities, exceptions, authority, and evidence must become visible. Care, capability, discourse, reciprocal justification, and non-domination provide important and partly complementary resources. Their conflicts remain a substantive philosophical programme.

Recursive openness adds an intertemporal test. Existential openness guarantees one continuing open route. Robust openness requires every admissible successor to preserve openness. The fixed-point results establish their formal relation, while the self-abrogation trilemma exposes the choice among unrestricted self-revision, robust persistence, admissibility limits, protected floors, and closure risk. Revisable universality can consequently be stated only relative to a declared bridge, bearer domain, horizon, recursive depth, floor, and meta-review path.

The framework remains revisable by design and by epistemic status. Stronger claims require defended bridge premises, primary-source comparison, empirical operationalization, institutional case analysis, and adversarial testing across heterogeneous subjects and environments. If those inquiries show that GREthic duplicates an established theory or fails to improve diagnosis, its concepts should be narrowed, redistributed, or abandoned. Its present contribution is a clear set of questions, distinctions, counterexamples, and formal obligations for that inquiry.

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