

Law as Constructed Niche: Reciprocal Causation Between Extended Phenotypes and Selective Environments in Institutional Evolution

Ignacio Adrián Lerer

ORCID: 0009-0007-6378-9749

Independent Researcher, Buenos Aires, Argentina

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ABSTRACT

Institutional evolutionary theory faces an unresolved causal direction problem. Extended Phenotype Theory (EPT) treats legal institutions as downstream phenotypic expressions of competing memes, while Niche Construction Theory (NCT) proposes that organisms actively modify their selective environments, generating reciprocal causation that EPT's unidirectional framework cannot capture. This paper argues that legal institutions are simultaneously (a) extended phenotypes of competing memes and (b) constructed niches that modify the selection pressures acting on those same memes and on future institutional generations. The synthesis integrates EPT (Dawkins 1982; Lerer 2025a, 2025b, 2025c) with NCT (Odling-Smee, Laland and Feldman 2003; Laland et al. 2015), engages the Ecological Niche of Knowledge framework (Khurshid 2025a, 2026a-f) as a case of civilizational-scale niche construction, and incorporates three contributions from Gould: exaptation as unintended niche construction, multilevel selection as the framework for cross-scale reciprocal coinfluence, and punctuated equilibrium as the macroevolutionary model for institutional stasis and crisis-driven change. Using the Constitutional Lock-in Index as a measure of niche rigidity and Heteronomous Bayesian Updating as the micro-level learning mechanism, six falsable predictions are derived: (P1) institutions with strong niche feedback will show different evolutionary trajectories; (P2) legal transplants will fail more often when the ecological inheritance gap is large; (P3) niche-modification reforms will outperform phenotype-attack reforms in high-CLI systems; (P4) high-CLI systems will exhibit niche conservatism beyond ESS predictions; (P5) ENK thickness will correlate

with CLI and IEI; and (P6) institutional exaptations will show a distinctive stasis-punctuation signature distinguishable from intentionally designed niches. Implications follow for EPT, for Tgmenks, for computational law, and for institutional design.

Keywords: niche construction theory, extended phenotype theory, legal institutions, memes, Constitutional Lock-in Index, ecological inheritance, institutional evolution, Tgmenks, ENK, Heteronomous Bayesian Updating

1. Introduction

The question of causal direction in institutional evolution has resisted resolution by both the Standard Evolutionary Theory and its successors. Two programs that operate on partially overlapping territory reach incompatible conclusions about where causality originates. Extended Phenotype Theory, developed by Richard Dawkins (1982) and applied to legal institutions in a series of recent papers (Lerer 2025a, 2025b, 2025c, 2025d, 2026), treats institutions as phenotypic expressions of competing memes: the replicator generates the institutional form, which persists or disappears according to how well it serves the replicator's propagation. Niche Construction Theory, developed by Odling-Smee, Laland, and Feldman (2003) and integrated into the Extended Evolutionary Synthesis by Laland et al. (2015), introduces a second causal arrow: organisms do not merely adapt to environments; they actively modify those environments, generating new selective pressures that act on themselves and their descendants. The two programs share a subject matter but disagree, at the level of causal ontology, about which agent drives evolutionary change.

A third program complicates the picture further. Khurshid's Tgmenks framework (2025a, 2026a-f) introduces the Ecological Niche of Knowledge (ENK) as a civilizational-scale ecological structure that preexists functionally as the condition of possibility for human cognitive and normative activity. Gene Machines operate within ENK rather than constructing it in any straightforward sense. This generates a genuine ontological tension with replicator-centered frameworks: if ENK preexists replicator competition, it cannot be an extended phenotype of any meme. The framework resists the assimilation that EPT would invite.

The incompatibility between EPT and ENK/Tgmenks is not merely terminological. It reflects a genuine disagreement about causal ontology that has direct consequences for institutional analysis: if the ENK preexists replicator competition, then the replicator cannot be the primary

causal agent in the institutional domain, and the entire EPT program requires revision. If, conversely, the replicator is primary, then ENK must be derivable from memetic competition across civilizational timescales, which Tgmenks resists. The present paper argues that this apparent dilemma rests on a false dichotomy. The resources for resolving it have been available in the biological literature since Odling-Smee, Laland, and Feldman (2003), but have not yet been applied to the institutional domain with sufficient precision. A complementary line of argument, developed in Lerer (2026a), demonstrates that the same Dawkins-Gould dispute about levels of selection dissolves in the cultural domain precisely because legal transmission is Lamarckian: the absence of a barrier between somatic modification and germinal transmission generates hierarchical structure rather than collapsing it, providing additional theoretical support for the multi-level analysis proposed here.

The central claim of this paper is that the incompatibility between EPT and Tgmenks/ENK is a specific instance of the broader unresolved debate between Extended Phenotype Theory and Niche Construction Theory. Resolving it requires neither capitulating to ecology-centered ontology nor insisting on the unidirectional primacy of the replicator. What the resolution requires is a synthesis: legal institutions are simultaneously (a) extended phenotypes of competing memes and (b) constructed niches that modify the selective environment for those memes and for future institutional generations. Unidirectional causality is insufficient. Reciprocal causation captures institutional dynamics better, and it does so without abandoning the meme's-eye view that makes EPT analytically powerful. A parallel argument, developed independently in Lerer (2026a), establishes that the apparent incompatibility between Dawkins and Gould at the level-of-selection debate also dissolves in the legal domain, precisely because the Lamarckian character of cultural transmission eliminates the Weismann barrier that makes the biological version of that dispute intractable. That parallel dissolution is not coincidental: both resolutions derive from the same underlying feature of legal evolution, the absence of a barrier between somatic modification and germinal transmission, which this paper formalizes in Section 3.2 as the mechanism that differentiates the NCT feedback loop in law from its biological counterpart.

This synthesis has practical consequences that extend beyond theoretical completeness. Most institutional reform effort is directed at the phenotype: change the law, amend the constitution, pass the regulation. Niche Construction Theory suggests that in highly conservative

institutional environments, phenotypic reform faces a structural obstacle: the niche filters out new phenotypes by selecting for the interpretive practices, enforcement patterns, and professional expectations that favor the existing phenotype. The high recidivism of legal transplants, the persistence of unconstitutional practices after formal constitutional amendments, and the durability of corruption networks under anti-corruption regimes are all consistent with this prediction. They are also consistent with what the Constitutional Lock-in Index (CLI) measures: niche rigidity rather than merely memetic stability.

Section 2 develops the theoretical frameworks in dialogue: EPT in institutional analysis (Section 2.1), NCT with its key concepts (Section 2.2), Khurshid's ENK (Section 2.3), three contributions from Gould that the synthesis requires, namely exaptation, multilevel selection, and punctuated equilibrium (Section 2.4), and the epistemological positioning of the synthesis (Section 2.5). Section 3 develops the synthesis across five dimensions: the dual character of legal institutions (3.1), reciprocal causation formalized, including the Weismann barrier argument that explains why the NCT feedback loop is faster in law than in biology while macro-level lock-in persists (3.2), ecological inheritance in law (3.3), Heteronomous Bayesian Updating as the micro-level niche-construction and Lamarckian inheritance mechanism (3.4), and the CLI reinterpreted as niche rigidity measurement (3.5). Section 4 derives six falsable predictions with preliminary empirical support from 60 reform episodes across four jurisdictions. Section 5 traces implications for EPT, for Tgmenks, for computational law, and for institutional design. Sections 6 and 7 address limitations and conclude.

2. Theoretical Framework

2.1 Extended Phenotype Theory in Institutional Analysis

Dawkins (1982) introduced the extended phenotype to designate phenotypic effects that reach beyond the body of the organism carrying the relevant genes. A spider's web is an extended phenotype: it is produced by the spider's genome but exists outside the spider's body. The web's adaptive value is assessed from the gene's perspective, not the organism's: does this construction increase the frequency of the alleles responsible for its production? The shift from organism-centered to gene-centered analysis is the core of the extended phenotype insight.

In the institutional domain, the extension is from genes to memes. A legal norm, a constitutional provision, a corporate governance rule is an extended phenotype of the memetic replicator that produces it. The norm persists if it serves the meme's propagation, and disappears if it does not. The analytical power of this framing lies in the *cui bono* question it permits: not what does the rule intend, but which replicator does it serve? Lerer (2025a) demonstrated this logic across five doctrinal domains: contract law, corporate governance, constitutional design, administrative regulation, and criminal law. In each domain, the extended phenotype framing revealed winner-memes whose propagation the formal rule served, independent of the rule's stated justification.

Two analytical tools developed in that program are directly relevant to the present synthesis. The Constitutional Lock-in Index (CLI; Lerer 2025b) measures how resistant a constitutional order is to memetic modification along four dimensions: amendment formalism, judicial interpretation conservatism, enforcement inertia, and professional-normative lock-in. Argentina's CLI of approximately 0.89 indicates a niche that conserves existing memes with high fidelity across generations; Chile's CLI of approximately 0.24 indicates a niche that allows faster memetic turnover. The Institutional Evolvability Index (IEI) measures the capacity for adaptive institutional change along variability, selection, complementarity, and memory dimensions. High-IEI systems generate more diverse institutional phenotypes and eliminate maladaptive ones faster.

The limitation of the pure EPT account, which this paper addresses, is that it treats the institutional environment as a product of replicator competition rather than as a force that acts back on the replicators. In standard EPT, the niche is downstream: it is a consequence of memetic activity, not an upstream condition that shapes which memes survive in the next generation. The niche does not have its own causal arrow. Odling-Smee's program challenges this assumption at the biological level; the institutional synthesis extends the challenge to the legal domain.

2.2 Niche Construction Theory

Odling-Smee, Laland, and Feldman (2003) developed NCT as a corrective to what they identified as an asymmetry in Standard Evolutionary Theory's treatment of organism-environment relations. In SET, the environment imposes selection pressures on organisms; organisms respond by adapting. The causal arrow runs from environment to organism. NCT introduces a second causal

arrow: organisms modify their environments through their activities, metabolisms, and choices, thereby altering the selection pressures that act on themselves, their descendants, and other species sharing the modified environment. This is what Odling-Smee called *reciprocal causation*: the organism adapts to environmental pressures and simultaneously reshapes those pressures through its own activity.

The key concept is ecological inheritance. Offspring inherit not only genes from their parents but also a modified environment: a niche that prior generations of organisms have constructed through their activities. This inherited niche is not genetically transmitted; it is transmitted through the persistence of physical and social structures. The beaver dam is the canonical example. A beaver constructs a pond through its dam-building activity. The pond persists after the beaver dies, and it is inherited by offspring who did not need to construct it themselves. The dam is simultaneously an extended phenotype of the beaver's genes, as Dawkins would have it, and a constructed niche that modifies the selection pressures on future beaver generations, as Odling-Smee would have it. Both descriptions are correct; neither is complete alone.

The direct debate between EPT and NCT is instructive for the institutional synthesis. Dawkins (2004) argued that niche construction qualifies as an extended phenotype only when there is a direct genetic benefit to the alleles responsible for the construction: the phenotypic effect must increase the frequency of the alleles that generate it. If a beaver's dam benefits a different beaver's offspring more than the dam-builder's own lineage, the dam is not, strictly speaking, a Dawkinsian extended phenotype. It should be noted that Dawkins (2004) simultaneously acknowledged that many cases of niche construction are compatible with the extended phenotype framework, and that the dispute with Odling-Smee is not categorical but concerns the scope of the concept and the analytical priority of the replicator. The contrast drawn here between EPT and NCT is therefore a difference of analytical emphasis and causal priority, not an irreconcilable ontological opposition. Odling-Smee's counter is that this account underestimates the reciprocal impact regardless of how scope is drawn: the pond creates an entire web of new selection pressures acting on other genes of the same beaver, including genes governing teeth morphology, digestive adaptation, social behavior, and territorial strategy, none of which are part of the dam-building allele complex. Dawkins treats the niche primarily as a product; Odling-Smee treats it as a co-constructor with its

own causal arrow. The synthesis proposed in this paper is compatible with the more nuanced version of both positions: the product and the co-constructor are the same structure viewed from different causal perspectives, and both perspectives are required for a complete account of institutional evolution.

Laland et al. (2015) integrated NCT into the Extended Evolutionary Synthesis, arguing that niche construction, together with developmental plasticity, epigenetic inheritance, and cultural transmission, constitutes a suite of evolutionary processes that SET does not adequately model. The EES is not a rejection of neo-Darwinism; it is an expansion of the causal repertoire recognized as evolutionarily significant. For institutional analysis, NCT provides a vocabulary that EPT lacks: the modified environment, the ecological inheritance, the second causal arrow. Legal systems are not only produced by memetic competition; they are also the inherited environments within which current and future memetic competition takes place.

2.3 The Ecological Niche of Knowledge

Khurshid's Tgmenks framework (2025a, 2026a-f) introduces the Ecological Niche of Knowledge (ENK) as the foundational structure of human cognition and social organization. ENK is the accumulated epistemic infrastructure of a civilization: stored knowledge, interpretive frameworks, communicative practices, and the institutional forms that enable Gene Machines to survive and reproduce cognitively. ENK is not an environment in the purely biological sense. It is a *semantically structured* environment, shaped by and for linguistic, deliberative, and normative activity. Survival and Success Capabilities (SSCs) are what Gene Machines develop to navigate ENK. MSSP (Meaning, Status, Security, Power) and MRSP designate the strategic orientations Gene Machines adopt within ENK.

The ontological move that distinguishes ENK from standard niche concepts is its preexistence. ENK does not emerge from current replicator competition; it preexists functionally as the condition of possibility of that competition. Gene Machines operate within ENK; they do not construct ENK in any simple sense available to any individual actor or generation. This is the source of the incompatibility with EPT. If ENK preexists replicator competition, it cannot be an extended phenotype of any particular meme. It is more fundamental than any meme currently competing within it.

The synthesis proposed here dignifies this intuition while relocating it within a broader evolutionary framework. ENK is neither a pure extended phenotype of currently competing memes nor a preexisting natural fact independent of all evolutionary history. It is a constructed niche built by prior generations of Gene Machines across millennia of cultural, legal, and epistemic activity. The niche now conditions current generations as an inherited environment. The fact that ENK appears preexisting to any individual Gene Machine is exactly what Odling-Smee predicts for any highly persistent constructed niche: the dam appears to the newborn beaver as a natural feature of the landscape, not as the artifact of prior beaver generations. ENK is the legal, epistemic, and normative dam that human civilization has built. Gene Machines currently alive inherit it without having constructed it. This reframing preserves what Khurshid's insight correctly identifies, namely the functional preexistence of the niche for any individual agent, while explaining that preexistence as the accumulated product of prior evolutionary construction rather than as a primitive ontological category.

2.4 Punctuated Equilibrium, Exaptation, and Multilevel Selection

Three contributions from Stephen Jay Gould enrich the synthesis in ways that neither EPT nor NCT alone provides. They are treated here as a corrective rather than a competing framework: Gould sharpens the analysis of causal levels, identifies a class of institutional niches that the EPT account systematically undervalues, and offers the best available macroevolutionary model for the stasis-and-punctuation pattern that the CLI measures empirically.

The first contribution is exaptation. Gould and Vrba (1982) introduced the term to designate features that were not originally built by natural selection for their current role but were co-opted for a new function from a prior structure or from a structural spandrel with no original adaptive purpose. The institution-as-constructed-niche analysis must include this class. Many legal institutions that now function as powerful niche constructors were not designed as niches. The adversarial procedure in common law was designed to find facts; it became a niche that selected for a particular type of legal professional, a particular rhetorical culture, and a particular conception of judicial passivity that its designers did not intend and could not have predicted. The Argentine system of amparo was designed as an individual rights remedy; it became a niche that selectively advantaged constitutional litigation memes over administrative law memes, reshaping the entire public law landscape in ways that were not part of its original design. Institutional exaptations are

constructed niches whose niche-constructing function was not part of the original extended phenotype. They arise as spandrels of prior memetic competition and, once established, operate as selective environments with their own causal force.

The second contribution is multilevel selection. Gould (2002) argued that selection operates simultaneously at multiple levels in a hierarchy: genes, organisms, demes, species, and clades. Selection at one level is not reducible to selection at another; entities at each level have properties that are emergent relative to the level below, and those properties are what selection at that level acts upon. For institutional analysis, this framework suggests a hierarchy of levels at which memetic competition and niche construction operate: individual legal actors (the micro-level of HBU), legal professional communities (the meso-level of interpretive tradition), legal systems as species-like individuals (the macro-level of CLI and IEI), and civilizational epistemic niches (the ENK level). Selection pressures at each level interact with those at adjacent levels in ways that can be synergistic, orthogonal, or conflicting. A meme that wins at the individual practitioner level may lose at the species level if it generates institutional phenotypes that are selected against at the system level. The ENK operates as a clad-level selective filter: it determines which types of legal systems are viable over civilizational timescales, independently of the fitness of any particular meme at the individual or professional community level.

The third contribution is Gould's charge against Dawkins that genocentrism confuses accounting with causation. In Gould's formulation, genes are the optimal *unit of accounting* for tracking evolutionary change; they are not thereby the *unit of causation*. Causation resides in the interactors: the entities that actually interact with the selective environment at the level where selection operates. Organisms, not genes, interact with predators; species, not organisms, interact with mass extinction events. Applied to the institutional domain: memes may be the optimal unit for tracking which cultural variants propagate, but institutional niches, professional communities, and civilizational structures are the interactors that causally shape which memes survive. The synthesis proposed in this paper is a partial concession to this critique. Reciprocal causation between memes and niches implies that the niche is not merely a downstream product of memetic competition; it is an interactor in its own right at the macro-level. Treating it as such does not abandon the meme's-eye tracking capacity of EPT; it adds the causal account that EPT's unidirectionality suppresses.

The fourth contribution is punctuated equilibrium (Gould and Eldredge 1977, 1993). The fossil record, rather than showing gradual continuous change, exhibits long periods of morphological stasis interrupted by brief episodes of rapid speciation. Gould argued that this pattern is not a sampling artifact but reflects a real feature of how evolutionary change occurs: most lineages are stabilized by developmental and ecological constraints for most of their history, and change is concentrated in speciation events. For institutional evolution, this model predicts the pattern that the CLI captures empirically: high-CLI systems exhibit institutional stasis across long periods, punctuated by brief episodes of rapid constitutional change, often triggered by exogenous shocks such as constitutional collapse, foreign occupation, or revolutionary transition. The mechanism in the biological case is developmental constraint plus ecological buffering; in the institutional case it is niche rigidity plus professional-normative lock-in. The CLI does not merely measure institutional stability in a static sense; it measures the constraint that makes punctuated change, rather than gradual reform, the dominant mode of institutional evolution in high-lock-in systems.

2.5 Epistemological Positioning

Following Lakatos (1978), this paper treats the EPT-institutional program as a research program with a hard core, a protective belt of auxiliary hypotheses, and a positive heuristic that generates new predictions. The hard core is the claim that memes function as replicators and that institutions are extended phenotypes of competing memes. The protective belt includes ESS applications to legal strategy, Heteronomous Bayesian Updating, the CLI, and the IEI. The positive heuristic points toward new empirical and computational applications.

The integration of NCT is an extension of the protective belt, not an abandonment of the hard core. The meme remains the primary unit of selection in the institutional domain; the claim added is that memes also construct selective environments through their phenotypic expressions, generating reciprocal causation that feeds back onto future memetic competition. The extended phenotype becomes, in this synthesis, a constructed niche: the phenotypic product of current memetic competition becomes the selective environment for future memetic competition.

Following Popper (1959), all theoretical claims are advanced as falsable. Section 4 provides five specific predictions with the conditions under which each would be refuted.

Following Hull (1988) and Campbell (1960, 1974), the criterion for evaluating theoretical extensions is whether they generate new, testable predictions rather than merely accommodating existing observations post hoc. The synthesis proposed here generates predictions that neither pure EPT nor pure NCT generates independently: predictions about the conditions under which niche feedback produces outcomes that deviate from pure ESS expectations, and about the differential success of phenotype-attack versus niche-modification reform strategies. Whether these predictions survive empirical scrutiny is an open question; they are offered as research invitations rather than established findings.

3. The Synthesis: Institutions as Constructed Niches

3.1 The Dual Character of Legal Institutions

Consider the Argentine Penal Code as a concrete case. From the EPT perspective, the Code is an extended phenotype of the punitive memplex: the ensemble of memes that define crime, punishment, social danger, and the legitimate scope of state coercion. The Code serves the punitive memplex by encoding its definitions in law, making them enforceable through the state apparatus, and shaping the interpretive practices of judges, prosecutors, and defense attorneys across generations. Which memes survive in Argentine criminal law is partly determined by which memes are consistent with the Code's provisions, its interpretive tradition, and the professional expectations of the criminal bar.

From the NCT perspective, the same Penal Code is a constructed niche. It modifies the selection pressures on actors and their memes. A lawyer practicing criminal defense in Argentina operates within a niche constructed by the Code and its interpretive tradition. The niche determines which argumentative strategies are viable, which rhetorical moves are rewarded by judges, which doctrinal innovations are likely to survive appellate scrutiny, and which professional identities are available to defense attorneys. The Code does not merely express the punitive memplex; it shapes the environment in which the next generation of criminal law memes will compete.

Neither description is complete alone. The EPT account explains the Code's content: why it criminalizes what it criminalizes, whose interests it serves, and which replicators constructed it through the legislative, judicial, and administrative processes that produced it. The NCT account explains the Code's effects: how it modifies the fitness landscape for future memes, why legal

transplants from different normative niches often fail, and why the same formal rule produces different behavioral outcomes in different institutional environments. The two descriptions are not competing; they are complementary analyses of the same object viewed from different causal perspectives.

The dual character is not a contradiction. It is a consequence of the fact that constructed niches are both products of prior replicator activity and ongoing constructors of the selective environment for future replicators. The Penal Code that Argentine criminal memes constructed in 1921 is now the niche within which Argentine criminal memes compete in 2026. The product of one generation's memetic competition becomes the selective environment for the next generation's memetic competition. This is the feedback loop that unidirectional EPT cannot capture and that NCT provides the conceptual resources to model.

3.2 Reciprocal Causation Formalized

Let $M(t)$ denote the memetic composition of a legal system at time t : the distribution of competing memes across doctrinal domains, weighted by their institutional prevalence. Let $N(t)$ denote the niche state at time t : the configuration of the institutional environment, including constitutional structures, interpretive conventions, enforcement mechanisms, professional norms, and the normative expectations that legal actors inherit from their training.

In the standard EPT account, the causal structure is unidirectional: $M(t)$ generates $N(t+1)$. Memes produce institutional phenotypes; the niche is downstream. $N(t)$ is treated as a consequence of $M(t)$, not as a cause of future memetic composition. The selective environment is, in this account, simply the arena within which memes compete; it does not itself select.

NCT introduces the second arrow: $N(t)$ generates $M(t+1)$. The institutional niche selects among memes in the next generation, filtering which memes gain institutional support, which professional practices survive scrutiny, and which interpretive innovations become durable precedent. The full reciprocal causal structure is symmetric: $M(t)$ shapes $N(t+1)$, and $N(t)$ shapes $M(t+1)$. This feedback loop generates dynamics that neither pure EPT nor pure NCT can predict in isolation.

The feedback loop has several analytically tractable implications. First, if the niche is strongly conservative (high CLI), $N(t)$ will tend to filter out memes that deviate from established

patterns, regardless of those memes' intrinsic competitive advantages. This is niche conservatism: the niche provides stability over and above what memetic fitness alone would produce. Second, if the niche is weakly conservative (low CLI), $M(t)$ operates with greater freedom, and the system shows faster memetic turnover. Third, the rate at which niche modification feeds back into memetic composition is a system-specific parameter that should be measurable across jurisdictions with varying institutional histories. Fourth, exogenous shocks to $M(t)$, such as foreign institutional influences, constitutional crises, or revolutionary memetic influxes, will have effects on $N(t+1)$ that depend critically on the niche's rigidity, not merely on the fitness of the competing memes.

A further dimension distinguishes the feedback loop in legal evolution from its biological counterpart in a way that sharpens the NCT synthesis considerably. In biology, NCT operates within a transmission environment constrained by the Weismann barrier: the developmental separation between germline and soma that prevents acquired somatic modifications from entering the hereditary material. A beaver can learn to build a better dam through behavioral experience, but this learned improvement cannot be transmitted directly to offspring through genetic inheritance. The niche modification feedback loop is therefore temporally asymmetric in biology: niche construction is fast, but its effect on heritable variation is slow, mediated by genetic selection across many generations.

Legal transmission has no Weismann barrier. When a judge applies a precedent and modifies it in the act of application, the modification enters the hereditary stream of legal doctrine immediately, without any separation between the somatic act of applying the rule and the germinal act of transmitting it. Cultural inheritance is, as Dawkins and Gould each acknowledged in different contexts, fundamentally Lamarckian: acquired modifications transmit directly to the next interpretive generation. The consequence is that the $M(t) \rightarrow N(t+1)$ arrow operates faster in legal evolution than in biological NCT. Niche modifications produced by institutional actors feed back into the next generation's memetic composition within years or decades rather than the evolutionary time required for genetic selection to act on biologically constructed niches. The reciprocal causal loop is tighter, the feedback more immediate, and the self-reinforcing dynamics of niche conservatism potentially more powerful than biological NCT would suggest (Lerer 2026a).

The paradox, and the theoretically significant finding, is that the absence of a Weismann barrier does not collapse the hierarchical structure. One might expect that if acquired modifications transmit directly and immediately, all hierarchical levels would change at equivalent rates, eliminating the multi-tempo pattern that the CLI captures. The empirical record contradicts this expectation. Constitutional lock-in persists across decades despite continuous doctrinal modification at the micro level; Argentina's constitutional architecture has resisted 23 reform attempts since 1991, a zero success rate at the macro level, while judicial interpretation of specific provisions shifts continuously. The explanation lies in the emergent properties of constitutional architecture: amendment procedures, judicial review scope, veto player configurations, and professional normative lock-in function as an institutional analog of developmental canalization. They do not block transmission in the genetic sense, but they filter which Lamarckian micro-level modifications accumulate sufficient institutional support to alter the niche's architectural properties. The absence of the Weismann barrier makes the $M(t) \rightarrow N(t+1)$ feedback fast and responsive at the doctrinal level; the architectural constraints make the feedback slow and punctuated at the constitutional level. Their coexistence is not a theoretical contradiction but the central empirical prediction of the hierarchical niche construction model, and the CLI is its principal diagnostic instrument.

The three contributions from Gould identified in Section 2.4 each map onto the $M(t)/N(t)$ formalism at distinct levels of the hierarchy. Punctuated equilibrium specifies the temporal structure of changes in N : the niche $N(t)$ does not change gradually but remains in stasis across extended periods and undergoes rapid structural transformation during threshold events. CLI measures the depth of the basin that sustains stasis; the macro-level punctuation events are the moments when exogenous shocks or accumulated micro-level pressure displace the system from its basin. Multilevel selection specifies the causal architecture of the feedback loops: selection at the level of N does not reduce to selection at the level of M because the niche has emergent fitness properties, in Gould's precise sense, that determine persistence or extinction through mechanisms irreducible to individual norm fitness. A normative regime's persistence depends on structural properties such as internal coherence, institutional embeddedness, and coalition support that do not exist at the level of individual memes; these are the emergent properties that make genuine niche-level selection possible. Exaptation identifies a specific class of $N(t)$: constructed niches whose niche-constructing function was not encoded in the original $M(t)$ that generated them. In

the $M(t)/N(t)$ formalism, exaptive niches arise when $N(t+k)$ acquires selective force in a domain orthogonal to the $M(t)$ that constructed it; this decoupling between original design and current selective function makes exaptive niches structurally harder to modify through phenotype-attack strategies than intentionally designed niches of equivalent formal scope, which is the basis for P6.

3.3 Ecological Inheritance in Law

Legal institutions are inherited environments in exactly the sense Odling-Smee intends for ecological inheritance. Each generation of lawyers, judges, legislators, and legal scholars inherits a normative niche constructed by prior generations. This inheritance is not transmitted genetically; it is transmitted through institutional persistence: the survival of constitutions across political discontinuities, the accumulation of codifications, the stability of precedential traditions, the reproduction of doctrinal curricula in law faculties, and the internalization of professional norms through socialization in legal practice.

This inheritance is not passive reception. The inherited niche actively shapes the development of each new generation of legal professionals. A lawyer trained in the Argentine administrative review tradition inherits not only the positive law of that domain but also the interpretive habits, the procedural expectations, the argumentative conventions, and the implicit theories of legitimate authority that prior generations of Argentine administrative lawyers constructed. The niche teaches through its structure: what arguments are available, which authorities are cited, what counts as a good-faith disagreement versus a frivolous claim. The newcomer must adapt to the niche before modifying it; and most lawyers never reach the second stage.

The replicators doing the constructing are memes rather than genes, but the logic of ecological inheritance is the same. The memes that shaped Argentine administrative law in the 1930s constructed a niche that constrained the memes available to Argentine administrative lawyers in the 2020s. The effect of prior memetic activity on current selective environments is mediated by institutional persistence: constitutions, codes, doctrines, and professional norms that survive across generations. The offspring of legal culture inherit the niche the parents built.

The implication for legal transplants is direct. When a legal system imports a rule from a foreign jurisdiction, it imports an extended phenotype without importing the constructed niche

within which that phenotype evolved and to which it is adapted. The imported rule is fit for its original niche; it may be deeply unfit for its reception niche. Legal transplants characteristically fail not because the imported rule is intrinsically defective but because the niche selection environment of the receiving system is different: it selects against the interpretive practices, professional expectations, and enforcement mechanisms that made the transplanted rule work in its jurisdiction of origin. This is the ecological inheritance gap: the difference between the niche the transplanted phenotype expects and the niche it actually encounters.

3.4 Heteronomous Bayesian Updating as Niche-Mediated Learning

Heteronomous Bayesian Updating (HBU; Lerer 2025c) is the mechanism by which legal actors learn norms from institutional reactions rather than from outcomes in the standard social learning sense. Under HBU, agents do not simply update their beliefs about which actions are likely to succeed instrumentally; they update their beliefs about which actions are permitted, expected, or obligatory, based on the signals that institutional reactions provide. A judge who penalizes an argumentative strategy sends a niche signal: this strategy is unfit for this interpretive environment. A regulatory agency that consistently rejects a class of compliance arguments signals: these arguments do not survive in this enforcement niche.

NCT provides a natural interpretation of HBU at the micro level: the constructed niche teaches through sanctions. The niche is not merely a passive selective filter; it is an active signaling environment that shapes the strategy space that future actors will consider. When enough lawyers receive the same niche signal consistently, they update not only their beliefs about what is permitted but also their beliefs about what is professionally conceivable: the strategy disappears from the repertoire not because it was explicitly prohibited but because the niche made it reproductively unfit.

The reciprocal dimension of HBU-as-niche-learning is also tractable. If enough legal actors successfully challenge a conventional interpretive practice, they modify the niche: the constructed environment changes in response to their collective activity, which then changes the selective pressures on subsequent actors. This is the full reciprocal causal loop at the micro level, complementing the macro-level formalization in Section 3.2. Niche modification is not only a product of legislative or constitutional reform; it is also the cumulative product of individually

small HBU updates that collectively shift the niche's selective pressures. In the terms of Section 3.2, HBU is the precise micro-level mechanism by which the absence of a Weismann barrier translates into rapid niche feedback: each judicial decision that modifies a doctrine in the act of applying it is simultaneously a Lamarckian inheritance event and a niche construction event, inserting a small modification into both the hereditary stream and the selective environment in a single causal operation (Lerer 2026a).

3.5 CLI as Niche Rigidity Measurement

The Constitutional Lock-in Index was developed to measure the resistance of constitutional orders to memetic modification (Lerer 2025b). Its four dimensions capture distinct mechanisms by which existing institutional configurations resist change: amendment formalism measures the procedural barriers to explicit constitutional change; judicial conservatism measures the tendency of interpretation to favor existing constitutional meanings; enforcement inertia measures the resistance of administrative and judicial enforcement to behavioral change even after formal rule change; and professional-normative lock-in measures how deeply existing institutional arrangements are embedded in professional identities and normative expectations.

The synthesis proposed here suggests a reinterpretation of CLI that is compatible with its original operationalization but theoretically richer: CLI measures niche rigidity, the resistance of the constructed institutional niche to modification by incoming memes. High CLI does not merely indicate that existing memes are strategically stable (in the ESS sense); it indicates that the niche actively filters out deviant memes before they can accumulate sufficient institutional support to challenge the existing configuration. The niche is doing selection work over and above what memetic fitness differences would produce.

This reinterpretation generates a prediction about the relationship between CLI and institutional stability that goes beyond what pure ESS analysis predicts. Under ESS alone, stability requires that no alternative strategy can invade the current strategy when it is prevalent. Niche conservatism adds a second mechanism: the niche makes invasion structurally difficult before competitive dynamics operate by filtering alternative memes at the level of institutional access. High-CLI systems should therefore exhibit stability even when alternative memes are objectively

fitter in the sense of being better adapted to changed environmental conditions. The memes cannot compete if the niche never allows them entry. This is the basis for Prediction P4.

The IEI (Institutional Evolvability Index) should correlate negatively with CLI under this framework: higher niche rigidity should produce lower institutional evolvability, and vice versa. Systems with high CLI and low IEI are characterized by niche conservatism: they persist in institutional arrangements that may be suboptimal relative to changed external conditions, not because those arrangements are fit but because the niche resists the entry of fitter alternatives. This is the evolutionary equivalent of what institutional economists call path dependence, but it operates through a distinct causal mechanism: niche filtering rather than sunk-cost lock-in.

4. Five Falsable Predictions

P1: Reciprocal Causation and Evolutionary Trajectories

Institutions exhibiting strong reciprocal causation, where the niche feedback is measurable as a distinct causal component independent of memetic fitness differences, should show different evolutionary trajectories than institutions with weak niche feedback. Specifically: institutions with strong reciprocal causation should show slower memetic turnover, greater doctrinal stability, higher resistance to external shock, and stronger reversion pressure after reform than institutions where the niche is minimally constructed or rapidly modifiable. This prediction is falsable against longitudinal comparative data on doctrinal change across jurisdictions with varying CLI scores: if CLI correlates positively with doctrinal stability after controlling for exogenous shocks, P1 is supported. If high-CLI and low-CLI systems show indistinguishable evolutionary trajectories under equivalent external shocks, P1 is falsified.

Preliminary evidence from 60 reform episodes across four jurisdictions provides initial support for P1. A logistic regression model with CLI as the primary predictor produces an R-squared of 0.74: each 0.1-unit increase in CLI reduces reform success odds by 63% (OR = 0.37, 95% CI [0.21-0.64], $p < 0.001$). Argentina (CLI approximately 0.89) exhibits zero structural reform success across 23 attempts since 1991, with a median reversion time of 18.3 months for reforms that achieved initial implementation; the interaction coefficient between CLI and crisis indicator variables is negative (Beta = -2.83, $p = 0.014$), indicating that macroeconomic crises intensify rather than relax constitutional lock-in, contrary to the 'window of opportunity'

hypothesis. Chile (CLI approximately 0.24) exhibits bidirectional constitutional reform with high micro-level change propagation. Brazil (CLI approximately 0.40) and Spain (CLI approximately 0.51) occupy intermediate positions consistent with their CLI values. The ordinal ranking of decoupling between micro-level doctrinal adaptation and macro-level reform success is monotonically consistent with P1 across all four cases (Lerer 2026a). These figures are preliminary; the sample size limits statistical power, and expansion to twenty or more jurisdictions is required for robust causal inference.

P2: Legal Transplant Failure and the Ecological Inheritance Gap

Legal transplants should fail more often when they import extended phenotypes without importing the constructed niche in which those phenotypes evolved. The ecological inheritance gap is the difference between the niche of origin and the niche of reception, measurable along the dimensions of the CLI and the IEI. When the gap is large, transplant failure should be more likely, more rapid, and more complete than when the gap is small. This prediction is falsable against comparative data on legal transplants: reforms imported from systems with similar institutional niches should succeed at higher rates than reforms imported from systems with dissimilar niches. If transplant success is independent of niche similarity after controlling for rule content, P2 is falsified.

P3: Niche Modification vs. Phenotype Attack

Institutional reforms that modify the niche selection environment, rather than directly attacking the institutional phenotype, should succeed more often in high-CLI systems. Niche modification strategies include: changing the interpretive community through judicial appointments that alter the prevalent interpretive memplex; changing legal education curricula to introduce alternative doctrinal memes to the next generation of legal professionals; and restructuring enforcement mechanisms to create new selective environments for compliance behavior. Phenotype attack strategies include: constitutional amendments that do not alter the interpretive community, statutory reforms that retain the same enforcement apparatus, and anti-corruption legislation implemented through the same agencies that have internalized the niche selective pressures favoring corrupt practices. If niche modification has no measurable advantage over phenotype attack in high-CLI systems, P3 is falsified.

P4: Niche Conservatism Under High CLI

Systems with high CLI should exhibit niche conservatism beyond what pure ESS analysis predicts: they should maintain existing institutional arrangements even when alternative arrangements are objectively fitter in the sense of producing better outcomes under current external conditions. Under ESS alone, stability requires that no alternative strategy can invade. Niche conservatism adds the prediction that high-CLI systems will resist objectively superior alternatives not because of memetic fitness differences but because the niche filters them out before competitive dynamics operate. This generates a specific testable pattern: high-CLI systems should show institutional stability even in the aftermath of external shocks that produce rapid institutional change in low-CLI systems, and the stability should be maintained even when formal evaluations of the existing arrangement are negative. If high-CLI systems adopt objectively superior institutional arrangements at the same rate as low-CLI systems following equivalent external shocks, P4 is falsified.

P5: ENK as a Macro-Level Niche Construction Variable

The Ecological Niche of Knowledge, operationalized as a macro-level civilizational niche construction variable along dimensions of accumulated epistemic infrastructure, institutional density, legal interpretive tradition depth, and normative integration, should correlate with both CLI and IEI across jurisdictions. The prediction is a three-way directional relationship: ENK thickness should correlate positively with CLI (richer epistemic infrastructure generates more rigid niches), negatively with IEI (more rigid niches are less evolvable), and positively with shock resistance (richer epistemic niches absorb external shocks without institutional collapse). This generates the additional prediction that ENK thickness and institutional brittleness are negatively correlated: high-ENK systems should show high rigidity but also high resilience to catastrophic collapse, while low-ENK systems should show higher evolvability but also greater fragility. If ENK measures are orthogonal to CLI, IEI, and shock resistance after controlling for GDP and institutional age, P5 is falsified.

P6: Institutional Exaptation and Niche Function Decoupling

Institutional exaptations, features that were not designed as niche constructors but that function as such, should show a distinctive evolutionary signature that distinguishes them from

intentionally designed institutional niches. Specifically: exaptive niches should show lower initial CLI (they were not designed to be self-perpetuating) but higher long-term resilience than non-exaptive niches of similar formal scope, because their niche-constructing function is decoupled from the original memetic intent and therefore harder to target in direct reform. A reform that attacks the original designed function of an exaptive niche will not eliminate the niche's selective force on the unintended domain; it may even strengthen it by removing competing uses. This prediction is falsable against comparative institutional analysis: if exaptive niches and intentionally designed niches show indistinguishable reform resistance profiles after controlling for formal scope and age, P6 is falsified. A corollary, derived from the Gould-Eldredge punctuated equilibrium model, is that institutional change in high-CLI systems should follow a punctuation pattern: long stasis interrupted by rapid change during constitutional crises or regime transitions, with reversion pressure toward the prior niche configuration once the punctuation event ends. If high-CLI systems show gradual, continuous reform at rates comparable to low-CLI systems between major constitutional events, this corollary is falsified.

5. Implications

5.1 For Extended Phenotype Theory

The integration of NCT does not require abandoning the meme's-eye view that gives EPT its analytical power. Reciprocal causation is compatible with, and enriches, the EPT framework. The meme still benefits from the institutional phenotype it generates; the addition is that the meme also shapes the environment that will select its own descendants. This is not a challenge to the replicator's primacy; it is an extension of the replicator's causal reach across time.

Mememes that generate institutional niches favorable to their own propagation in subsequent generations enjoy a second-order competitive advantage over mememes that generate less favorable niches. A constitutional meme that, in addition to serving current propagation, constructs a niche that filters out competing mememes before they can accumulate institutional support is fitter, in an extended sense, than a constitutional meme that serves current propagation but leaves the selective environment open to invasion. Niche construction is a memetic strategy, not merely a memetic consequence.

The extended phenotype, reconceived as a constructed niche, is not merely an expression of the meme's current fitness. It is an investment in the meme's future selective environment. Far from undermining EPT, the NCT integration provides EPT with a mechanism for explaining why some extended phenotypes persist far longer than their apparent current fitness would predict: they persist because they have modified the selective environment in their own favor, generating niche conservatism that maintains them across generations even when fitter alternatives exist.

5.2 For Tgmenks

The ENK, reconceived as a constructed niche at civilizational scale, can be formalized within an evolutionary framework without reducing it to a mere product of current replicator competition. The niche has its own causal force precisely because prior construction by generations of Gene Machines created selection pressures that are now partially autonomous: they operate independently of the intentions of any current generation and resist modification by any current memetic competitor. The dam the beaver did not build but inherited still floods the meadow.

This formalization preserves what Khurshid's framework correctly identifies: that ENK preexists functionally for any individual Gene Machine. The preexistence is real and consequential. The resolution proposed here is that ENK preexists in the same sense that a highly persistent constructed niche preexists for any organism born into it. The niche appears as a natural feature of the landscape because its construction was the work of prior generations whose activity has been absorbed into the background of current experience. ENK is the legal, epistemic, and normative infrastructure that human civilizations have built across millennia. Its apparent preexistence is the mark of successful niche construction, not a sign of its ontological independence from evolutionary history.

The incompatibility between Tgmenks and replicator-centered EPT that Khurshid correctly diagnosed is real and not dissolved by this synthesis. It is relocated at a more tractable level: ENK is not a product of current replicator competition, and it cannot be treated as an extended phenotype of any currently competing meme. It is the accumulated product of prior replicator competition across civilizational timescales, now operating as an autonomous selective force on current competitors. This concession to Khurshid's intuition is substantial, and the synthesis benefits from

it: ENK becomes theoretically tractable as civilizational-scale niche construction without being reduced to the product of any individual replicator's strategy.

5.3 For Computational Law

Niche construction variables should be incorporated into agent-based models of institutional evolution alongside replicator variables. Current ABM specifications in computational law, including MLSARS and SNMS (Lerer 2026b), typically implement the institutional environment as a static background parameter: the niche is given, and agents compete within it. The NCT-EPT synthesis requires implementing the niche as a dynamic variable that changes in response to agent activity and feeds back into agent fitness and strategy availability.

The computational extension has a specific implementation direction. The feedback loop from agent action to niche state to agent fitness to agent action must be closed in the model. Without niche feedback, ABMs of legal evolution underestimate path dependence in high-CLI systems and overestimate the rate of institutional change following exogenous shocks. Including niche rigidity as a dynamic parameter that agents both respond to and modify through their collective behavior generates richer and more realistic dynamics. The five predictions in Section 4 provide testable benchmarks for evaluating whether computational models with niche feedback outperform static-niche models against empirical data on institutional change.

5.4 For Institutional Design

The distinction between modifying the phenotype and modifying the niche has practical consequences for institutional reform that most reform programs systematically underestimate. Most institutional reform effort is directed at the phenotype: change the law, amend the constitution, pass the regulation. The NCT-EPT synthesis suggests that these efforts face a structural obstacle in high-CLI systems: the niche filters out the new phenotype by selecting for the interpretive practices, enforcement patterns, and professional expectations that favor the old phenotype. Phenotypic reform in a rigid niche produces phenotypic reversion: the new rule is formally enacted but absorbed into the existing niche interpretive structure, producing behavioral continuity with the old regime.

More effective reform modifies the niche: it changes who interprets the law, who teaches it, who enforces it, and who transmits it to the next generation of legal professionals. Judicial

appointments that alter the dominant interpretive memplex are niche engineering. Legal education reforms that introduce alternative doctrinal memes to the next cohort of lawyers are niche construction. Agency restructuring that changes the selective pressures on compliance behavior is niche modification. These interventions are slower and less visible than phenotypic reform, but they are more durable because they change the selection environment for future memes rather than merely importing a new phenotype into an unchanged niche.

The recurrent failure of anti-corruption legislation in high-CLI jurisdictions illustrates the point. The legislation is the phenotype; the enforcement culture, the prosecutorial incentives, the judicial interpretation practices, and the professional norms that govern compliance constitute the niche. Importing new anti-corruption phenotypes into a niche that selects against anti-corruption memes produces the predictable outcome: phenotypic reversion within a generation. The formal rule survives; the behavioral reality does not change. Effective anti-corruption reform, on this analysis, requires niche modification: changing the selective pressures that determine which memes survive in prosecutorial, judicial, and compliance professional environments, not merely changing the formal prohibition.

6. Discussion and Limitations

The synthesis proposed here faces objections that merit direct acknowledgment.

The first objection is the reductionism charge. The NCT-EPT synthesis reduces the ENK, a rich and semantically complex civilizational structure, to a biological analogy that may strip it of its normative specificity. Khurshid's framework treats ENK as irreducibly normative: it is not merely an ecological structure but a semantically organized one, shaped by intentional, deliberative, and evaluative activity. The biological analogy, even extended to memes and constructed niches, may inadequately capture these dimensions.

This objection has genuine force. The response is not to deny the normative specificity of legal institutions but to note that evolutionary mechanisms and normative structures are not mutually exclusive levels of description. Explaining how legal norms spread, persist, and evolve through constructed-niche mechanisms does not explain why any particular norm is better than its competitors. The synthesis is a causal account, not a normative justification. It says nothing about

which memes deserve to win; it describes how niches bias the competitive landscape. The normative evaluation of that landscape remains a separate and equally important inquiry.

The second objection is the operationalization challenge. The five predictions in Section 4 require operationalizing ENK thickness, niche feedback strength, and ecological inheritance gap in ways that are currently underdeveloped. CLI is already operationalized and validated against comparative constitutional data, but its reinterpretation as niche rigidity requires validation against independent measures of niche persistence that have not yet been constructed. The predictions are therefore research invitations at present rather than near-term testable hypotheses. This is a genuine limitation of the current formulation.

The third objection is the teleology risk. Niche construction language can slide toward functional language: the niche 'favors' certain memes, 'filters out' others, 'teaches' through sanctions. This risks importing teleological assumptions into an ostensibly mechanistic framework. The response, following Hull (1988), is that functional language is always paraphrasable in causal terms. 'The niche favors meme X' means 'the selection pressures produced by the niche increase the frequency of meme X in the next generation.' The functional language is heuristically convenient but not explanatorily basic, and no claim in this paper requires the teleological reading.

A fourth objection derives from Godfrey-Smith's (2009) framework for evaluating Darwinian populations. Godfrey-Smith distinguishes paradigm Darwinian populations capable of generating cumulative, complex adaptation from marginal cases that only loosely approximate the minimal conditions for natural selection. His skepticism about memes as paradigm Darwinian populations rests on the 'too smart' problem: if cultural learners blend multiple models, conform to majorities, or synthesize behaviors intelligently, the clear parent-offspring lineages required for cumulative Darwinian evolution dissolve. The NCT synthesis inherits this vulnerability because reciprocal causation requires that the niche modification produced by intelligent legal actors feed back with sufficient fidelity to constitute genuine hereditary inheritance.

Legal norms, however, occupy a distinctive position in Godfrey-Smith's framework that partially deflects this objection. Three features push legal norm populations toward the paradigm end of the spectrum. First, written legal texts achieve unusually high hereditary fidelity: a statute enacted in 1853 is transmitted to present-day practitioners in essentially the same form. Latin legal

maxims achieve near-perfect copying fidelity precisely because they are encoded in a dead language immune to semantic mutation. Second, legal norm populations exhibit a functional germ-soma distinction: appellate judges, legislators, and influential scholars function as a germline whose outputs enter the doctrinal canon, while the vast majority of practitioners function as soma, applying norms without modifying the hereditary stream. Third, the fitness landscape for doctrinal norms exhibits moderate continuity, permitting the incremental, cumulative evolution that Godfrey-Smith requires for paradigm status. The objection does not refute the memetic approach; it refines it by identifying which features of legal transmission bring norm populations closer to the paradigm case.

Finally, the paper relies on the meme concept, which remains contested in both philosophy of mind and cultural evolution studies. If memes fail as theoretical entities, the EPT-institutional program fails with them, and the synthesis inherits that vulnerability. This paper takes no position on the metaphysical status of memes beyond treating them as useful analytical constructs for tracing the propagation and selection of cultural replicators in legal domains. Whether they constitute a genuine natural kind, in the sense Hull (1988) requires, is a question this paper leaves open.

7. Conclusion

Three theoretical programs occupy the same territory with incompatible causal ontologies. Extended Phenotype Theory treats the replicator as the primary causal agent; institutions are downstream phenotypes. Niche Construction Theory treats the organism-environment relationship as reciprocally causal; organisms modify their environments, generating selection pressures that act on themselves and their descendants. Tgmenks/ENK treats the Ecological Niche of Knowledge as a preexisting civilizational structure that conditions Gene Machine activity without itself being reducible to current replicator competition.

The incompatibility between the first and third programs is a specific instance of the broader tension between EPT and NCT. The resolution proposed here is a synthesis: legal institutions are simultaneously extended phenotypes of competing memes and constructed niches that modify the selective environment for those memes and for future institutional generations. Reciprocal causation replaces unidirectionality. The Lamarckian character of legal transmission,

by eliminating the temporal asymmetry that the Weismann barrier imposes in biological NCT, makes the feedback loop tighter at the micro level while leaving the macro-level architectural constraints intact: the mechanism that explains both the speed of doctrinal adaptation and the durability of constitutional lock-in is the same mechanism, operating at different hierarchical levels.

The synthesis generates six falsable predictions, with preliminary empirical support from 60 reform episodes across four jurisdictions. It has implications for EPT (the extended phenotype reconceived as a niche-constructing investment in future selective environments), for Tgmenks (ENK reconceived as civilizational-scale niche construction without reduction to current replicator competition), for computational law (niche feedback loops in agent-based institutional models), and for institutional design (niche modification as a more durable reform strategy than phenotype attack in high-CLI systems).

The dam the beaver built belongs to its children. The legal niche that prior generations constructed belongs to us. Neither the dam nor the law is the product of current replicator competition; both are inherited environments that shape the competition that will determine what the next generation inherits. Recognizing this is not a departure from evolutionary thinking about institutions. It is evolutionary thinking applied to its full temporal depth.

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