

UC Riverside

Cliodynamics

Title

Cultural Adaptation and the Uneven Emergence of Large-Scale Cooperation

Permalink

<https://escholarship.org/uc/item/78s3b7sm>

Journal

Cliodynamics, 17(1)

Author

Galor, Oded

Publication Date

2026-06-30

DOI

10.21237/C7clio.66476

Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at

<https://creativecommons.org/licenses/by/4.0/>

Cultural Adaptation and the Uneven Emergence of Large-Scale Cooperation

Oded Galor

Brown University, NBER, and CEPR

This essay suggests that the evolution of human cooperation should be viewed as a two-layer process. A foundational layer, rooted in subsistence and ecological pressures, shaped cooperative dispositions unevenly, whereas a reinforcing layer, rooted in conflict and stratification, facilitated large-scale cooperation in societies in which the seeds of cooperation had already formed while intensifying fragmentation elsewhere. The foundational layer unfolded over the grand arc of human evolution, reinforcing the capacity for small-scale cooperation in hunter-gatherer societies and favoring traits complementary to cooperation in some sedentary societies but not in others, as selective pressures diverged following the Neolithic Revolution. The reinforcing layer emerged as rising population density increased the returns to public infrastructure, heightened the risk of conflict, and increased the demand for social coordination. In environments where cooperation-enhancing traits were already present, these forces facilitated the emergence of institutions conducive to large-scale cooperation, whether voluntarily sustained or imposed through political authority and coercion. Yet in settings where such cultural foundations were absent, collective action was more challenging, and conflict was often destabilizing, magnifying division and political fragility. Recognizing the heterogeneity in cooperative predispositions produced by the foundational layer is therefore essential for identifying the origins of large-scale cooperation and the conditions under which conflict reinforced cooperative capacity rather than intensifying fragmentation.

1. Roots of Cooperation and Social Complexity

The journey of humanity across the millennia has been shaped by profound demographic, technological, and social transformations. One of the most consequential developments along this path has been the expansion of cooperation from small, predominantly kin-based groups to large and complex societies.

Corresponding author's e-mail: oded_galor@brown.edu

Citation: Galor, Oded. 2026. Cultural Adaptation and the Uneven Emergence of Large-Scale Cooperation. *Cliodynamics* 17(1): 129–146.

Human cooperation, like that among other primates, took shape largely within small groups and was sustained through repeated interaction, informal enforcement, reciprocity, and kin-based trust. For most of human existence, cooperation remained limited in scope, often anchored in kinship networks. Yet the emergence of sedentary agricultural communities during the Neolithic Revolution, nearly 12,000 years ago, broadened the scope for cooperation, fostering collective action at an unprecedented scale.

As population density rose in the course of the Agricultural Revolution, ambitious communal projects became increasingly feasible and productive. Cooperation extended beyond kinship, encompassing the construction of irrigation systems, communal storage facilities, transport corridors, and defensive structures, as well as the formation of standing armies. These initiatives stabilized production, mitigated scarcity, linked settlements and markets, strengthened communal security, and sustained increasingly complex forms of social organization. Yet this expansion of cooperation was far from uniform across societies.

Why did cooperation extend beyond the narrow boundaries of kinship in some societies, while remaining limited or fragmentary in others? Two distinct but interacting evolutionary layers appear to have been instrumental in this uneven development. The first layer unfolded over the grand arc of human evolution under subsistence and ecological pressures, shaping cooperative dispositions across societies. In hunter-gatherer societies, these forces fostered a capacity for cooperation within small, kin-based groups, and this capacity hardly differed across regions. Yet in the aftermath of the Neolithic transition, as human populations settled in diverse ecological environments and selective pressures diverged, cultural adaptation favored traits complementary to cooperation in some ecological niches but not in others, generating cross-societal variation in the foundations upon which large-scale cooperation could later emerge.

The second evolutionary layer emerged as rising population density intensified social interaction and conflict, deepened political stratification, and increased the importance of public infrastructure. These developments heightened the demand for coordination beyond local groups, institutional formation, and political authority. In regions where cooperative predispositions were already prevalent, these pressures, amplified by intergroup conflict, facilitated coordination at scale, often enforced through political coercion. Yet in regions where such cultural foundations were weaker, large-scale cooperation was more difficult to sustain, and conflict often proved destabilizing, magnifying division, predation, and political fragility rather than fostering enduring collective action.

Recognizing the distinct roles of these two evolutionary layers is essential for understanding the historical scaling of cooperation and the contribution of intergroup conflict to this process. Cooperative predispositions shaped by the

foundational layer influenced the incidence of conflict and affected the capacity to respond to it. Observed associations between conflict and cooperation may therefore reflect reverse causality or forces that jointly shaped cooperative capacity and exposure to conflict. Identifying the causal effect of conflict on cooperation would therefore require disentangling the role of persistent cooperative predispositions from the incremental impact of conflict.

2. Cooperation Through Conflict and Group-Based Selection

2.1 The Conflict-Centered Account of Cooperation

Human societies did not evolve in isolation. They emerged alongside neighboring communities, competing over fertile land, reliable water sources, and essential raw materials. In this environment of intergroup rivalry, survival and prosperity often hinged on the capacity to mobilize labor and resources for collective defense and public infrastructure. External threats have often strengthened cohesion and coordinated action through voluntary cooperation, hierarchical authority, or coercion.

Turchin (2025) advances an insightful conflict-centered theory of cooperation, arguing that sustained intergroup rivalry played a central role in the rise of large-scale hierarchical societies. In his account, warfare favored social structures capable of collective mobilization, centralized authority, and military strength, thereby promoting sociopolitical complexity and public goods provision. He examines this argument using longitudinal evidence from hundreds of premodern societies recorded in the Seshat Global History Databank.¹

Seen through this lens, the surplus generated by public goods was not necessarily the primary force behind the initial scaling of human cooperation. Rather, intergroup conflict increased the importance of large-scale coordination for collective prosperity and survival. Under external threat, societies with greater organizational capacity were better able to mobilize labor and resources, withstand attack, and prevail over less effectively coordinated neighbors. Intergroup conflict thus operated as a selective mechanism, conferring an advantage in survival and territorial expansion on societies capable of large-scale coordination.²

¹ While Turchin recognizes that warfare does not invariably generate greater social complexity and may under some conditions remain destructive, his theoretical synthesis and empirical analysis assign intergroup competition a broadly cooperation-enhancing role in the historical expansion of social scale and complexity.

² Related contributions include analyses of the role of intergroup conflict in maintaining cooperation within groups by advantaging more cohesive social formations (Bowles & Gintis 2011), experimental evidence on the role of norm enforcement and punishment in

2.2 Historical Illustrations of Conflict-Based Cooperation

Patterns consistent with these predictions appear across ancient and pre-Columbian civilizations (Turchin 2025). In ancient China, recurrent warfare across the Yellow River plains, especially along the northern frontier with steppe societies, necessitated systematic grain storage, long-distance logistics, and organized public labor for defensive walls, canal transport, and irrigated agriculture, thereby reinforcing centralized authority. As coordination expanded from local clans to regional states, political consolidation became more durable, and periods of unification brought greater institutional stability. A similarly direct pattern emerged in the Aztec heartland of the Basin of Mexico, where rivalry among city-states required pooled resources, tribute collection, and sustained military provisioning, contributing to the formation of the Triple Alliance and the rise of the Aztec Empire. In Mesopotamia, invasions and interstate rivalries repeatedly tested political organization, favoring polities capable of restoring authority and mobilizing resources on a broader scale. Across these regions and time periods, conflict operated as a selective force, favoring polities capable of converting collective action into sustained large-scale mobilization beyond kinship networks, often through coercive authority rather than broad-based popular allegiance.

2.3 Empirical Evidence and Identification Challenges

Drawing on the Seshat Databank, the empirical analysis in Turchin (2025) explores the impact of the intensity of warfare across hundreds of pre-modern polities on sociopolitical complexity, population scale, and institutional capacity, using panel regressions over long horizons. Yet, despite the exceptional breadth of the Seshat Databank, the historical nature of the evidence inevitably limits the extent to which the empirical analysis can fully identify the underlying causal mechanisms and test the theory's nuanced implications.

No Direct Measure of Cooperation

The empirical analysis does not employ a direct measure of cooperation and therefore tests the theory's central behavioral mechanism indirectly. It examines whether periods of heightened intergroup conflict are followed by expansions in state centralization, surplus mobilization, and territorial scale. Yet these

sustaining cooperative behavior (Fehr & Gächter 2002), theories of conflict-driven political consolidation (Carneiro 1970), examinations of warfare and social complexity as drivers of large-scale cooperation (Turchin 2003, 2015), and the political economy of coercive coordination and extraction (Olson 1993).

institutional outcomes, while plausibly reflecting large-scale cooperation, do not directly capture it.

Survivorship Bias in Historical Samples

The historical sample is unavoidably shaped by systematic selection. The historical record disproportionately reflects societies that prevailed over time, overrepresenting cases in which conflict strengthened cooperation and political survival. Societies in which conflict yielded collapse, dispersal, or extinction are underrepresented, thereby biasing the sample toward cases consistent with the hypothesis.

Correlation Versus Causation

Observed associations between conflict and cooperation reflect reverse causality or factors that jointly shaped cooperative capacity and the incidence of conflict, rather than solely the causal effect of conflict on cooperative behavior. Involvement in intergroup conflict was not independent of underlying cooperative capacity. Societies capable of effective coordination were better positioned to prevail in conflict and were therefore more likely to engage in it. Moreover, the effect of conflict varied with pre-existing cooperative dispositions, strengthening coordination where such foundations were well developed while intensifying fragmentation where they were weak.

This identification problem is not resolved by considering conflicts triggered by droughts, invasions, or other external shocks. Although the shocks themselves may be plausibly exogenous, their effect on the onset and intensity of conflict depends on pre-existing cooperative predispositions.

Furthermore, estimating the impact of lagged conflict on proxy indicators of cooperation does not circumvent these challenges. Cooperative predispositions persist over time and shape both a society's earlier exposure to conflict and its subsequent capacity for cooperation. Lagged conflict is therefore correlated with the pre-existing predispositions that influence current cooperative outcomes, so the estimated relationship may still capture these underlying cultural foundations rather than the incremental effect of conflict itself.

Assessing the causal effect of conflict on cooperation therefore requires the formidable task of disentangling persistent underlying cooperative predispositions from any incremental effect attributable to conflict itself. In the absence of a natural historical quasi-experiment that exposed societies to conflict independently of their predisposition to cooperate, the causal effect of conflict would be exceedingly difficult to identify credibly.

2.4 The Limits of Conflict-Driven Selection

More fundamentally, however, conflict cannot by itself account for why some societies coordinated with ease while others fragmented under pressure. External danger may have catalyzed collective effort, but it operated on cooperative predispositions that long predated the onset of warfare. These predispositions were not the product of conflict itself. Rather, they emerged unevenly over millennia as human populations adapted culturally to distinct ecological conditions that differentially reinforced orientations conducive to cooperation. In societies where such foundations had taken root, conflict amplified cooperation and channeled it into durable political organization. In contrast, in societies where these predispositions had not developed, conflict was less likely to generate the behavioral substrate required for large-scale coordination, constraining the emergence of complex social structures.

The conflict-based mechanism therefore accounts for how cooperation is scaled in response to external threats, but such scaling may presuppose deeper cooperative predispositions that long predate the onset of warfare. What, then, are the evolutionary origins of these predispositions and why do they determine whether conflict unifies societies or instead propels them toward social fragmentation?

3. Evolutionary Origins of Cooperative Capacity

Long before intergroup warfare magnified the value of cohesion, the foundations of cooperation were shaped by ecological precariousness, as failure to secure resources threatened group viability. In hunter-gatherer societies, ecological volatility heightened the value of cooperation, and behavioral traits that enabled groups to secure resources collectively and withstand scarcity proliferated through cultural transmission. Since environmental pressures were pervasive across early human environments, selection for cooperative behavior exhibited limited variation across hunter-gatherer groups, among whom close social ties, mutual dependence, and community-based enforcement maintained cooperation.

Yet, in the course of the Neolithic Revolution, as settlement patterns and subsistence regimes diverged worldwide, environmental pressures became increasingly heterogeneous, generating differential selective pressures across societies. In some regions, environmental pressures shaped a broader set of traits complementary to cooperation, reinforcing existing behavioral dispositions supportive of collective action. In others, the emerging traits may have hindered cooperation, giving rise to persistent cross-regional variation in the behavioral foundations of large-scale coordination.

3.1 Foundations of Cooperative Capacity

A broad theoretical tradition has sought to explain the roots of cooperation through cultural evolutionary processes. These frameworks illuminate the mechanisms through which cooperative predispositions emerge, spread, and stabilize within human populations. They underline that cooperative behavior may propagate through social learning and imitation, while being sustained by sanctions and reward structures (Boyd & Richerson 1985, 2005; Richerson & Boyd 2005; Henrich 2016; Henrich, Richerson & Boyd 2016).³

Yet why did conflict trigger a pronounced expansion of cooperation in some societies, while yielding far weaker or even destabilizing outcomes in others? What role does variation in cultural adaptation across diverse ecological niches play in shaping cross-societal differences in cooperative predispositions that mediate the impact of conflict on coordination? This foundational layer is essential for understanding both the conditions under which conflict amplified cooperation and those under which it instead exposed latent vulnerabilities.

3.2 Adaptive Origins of Cooperation-Enhancing Traits

Why did some ecological environments foster cultural traits conducive to cooperation, while others favored traits that could have hindered cooperation? Tracing the roots of cooperative capacity hinges on identifying how variation across ancestral environments shaped cultural predispositions across the globe.

Over most of human existence, culturally transmitted predispositions that enhanced household resilience in the prevailing Malthusian conditions conferred an evolutionary advantage and therefore persisted and diffused across generations. Yet diverse ecological environments characteristic of world regions inevitably generated variation in these adaptive processes and, consequently, in the cultural traits that emerged across the globe. In particular, these adaptive processes favored cooperation-enhancing traits in some environments, enabling cooperation beyond kinship, while fostering traits that may have hindered cooperation in others.⁴

³ Differential adaptability may arise from heterogeneity in the environment (Diamond 1997, Ashraf & Galor 2011, Galor, 2022) or from diversity within the human population (Ashraf & Galor 2013).

⁴ Societies with greater inherited cultural diversity adapt more effectively to local ecological conditions, as a broader range of initial cultural predispositions increases the likelihood that behaviors complementary to prevailing environments are selectively reinforced over time. When ecological conditions reward coordinated action, this adaptive process makes the emergence and persistence of cooperative orientations more likely in more diverse populations (Galor, Klemp & Wainstock 2026).

Environmental pressures that rewarded investment in future productive capacity, the stabilization of consumption across seasons, protection against catastrophic shocks, or the strengthening of intergenerational transmission of skills increased the prevalence of the corresponding traits within local populations. Conversely, when these dispositions were poorly suited to prevailing constraints, alternative behavioral tendencies gained traction. Over time, this process of adaptation generated enduring regional differences in the prevalence of cooperation-enhancing traits, shaping the capacity to scale cooperation as institutional development and intergroup conflict intensified.

Several traits that emerged in response to distinct environmental pressures are particularly consequential for the scalability and durability of cooperation: a future-oriented mindset, restraint, loss aversion, and a predisposition toward parental investment in offspring. A future-oriented mindset supported investment in shared infrastructure; restraint promoted reliability and adherence to cooperative norms; loss aversion fostered prudent cultivation methods that could shield individuals from catastrophic losses; and parental investment in offspring cultivated the skills, trustworthiness, and intergenerational continuity on which stable coordination rests.

Future-Oriented Mindset

A greater predisposition toward future orientation emerged in regions where agroclimatic conditions gave rise to crops with higher potential yields. In these environments, delaying consumption in order to invest in planting and cultivation generated greater economic returns. Future orientation and restraint consequently contributed to household prosperity and persisted and diffused across generations through vertical and horizontal cultural transmission (Galor & Özak 2016).⁵

Loss Aversion

Predispositions toward loss aversion adapted to the nature and intensity of climatic volatility. Over time, societies exposed to climatic shocks that were widespread across entire regions, and therefore difficult to insure through local diversification, developed a stronger predisposition toward loss aversion. In contrast, societies facing predominantly localized or idiosyncratic climatic shocks, which could be buffered through spatial diversification or exchange, developed more loss-neutral orientations (Galor & Savitskiy 2022).⁶

⁵ Culture–language coevolution gave rise to the evolution of complementary linguistic features, such as the grammatical encoding of the future tense (Galor, Özak & Sarid 2025).

⁶ This pattern is supported by evidence linking historical climatic volatility to contemporary variation in loss aversion across countries, regions, and ethnic groups, including among

Predisposition toward investment in offspring

Predispositions toward investment in offspring adapted to the long-run returns to human capital. Biogeographical conditions that facilitated an earlier onset of the Neolithic Revolution and an earlier transition to sedentary agriculture gave rise to cognitively demanding occupations in markets and trade, increasing the returns to literacy, numeracy, mechanical aptitude, agronomic knowledge, and tool use. In these environments, families that invested more intensively in their children achieved greater economic success and long-run viability, giving rise to a stronger predisposition toward parental investment (Galor & Moav 2002; Galor & Klemp 2019).

4. Conflict and Cooperation: A Unified Framework

Large-scale cooperation emerged through the interaction between two distinct evolutionary layers. A foundational layer, shaped by long-run ecological and cultural adaptation, generated uneven predispositions toward cooperation across societies. A reinforcing layer, operating through intergroup conflict, political consolidation, and the growing demand for collective mobilization, acted upon these heterogeneous foundations.

Societies in which cooperative predispositions were more deeply rooted were better able to mobilize resources, sustain coordinated action, and convert external pressures into taxation, public infrastructure, bureaucratic capacity, and political centralization. In societies where these foundations remained weak, the same pressures were more likely to intensify fragmentation and political fragility. Conflict therefore did not exert a uniform effect on cooperation; its consequences depended on the cooperative capacity that had emerged during the foundational layer.

The foundational layer shaped not only the consequences of conflict but also its emergence, as pre-existing cooperative capacity influenced societies' ability to initiate, sustain, and prevail in conflict as well as their response to it. Conflict was therefore endogenous to the cultural foundations of cooperation. Observed associations between warfare and sociopolitical complexity may consequently reflect both the reinforcing effect of conflict and the greater propensity of societies with stronger cooperative foundations to engage successfully in sustained intergroup competition.

second-generation migrants whose attitudes reflect the climatic conditions of their ancestral homelands. A related culturally adaptive development was the rise of an entrepreneurial orientation in settings that reinforced experimentation and rewarded innovative activity (Galor & Michalopoulos 2012).

In the spirit of Unified Growth Theory (Galor 2005, 2010, 2011, 2022, 2025), the evolution of cooperation ought to be explored within a unified framework that integrates the two layers of its historical formation. Abstracting from this sequential process, and in particular from the uneven distribution of cooperative predispositions generated by the foundational layer, yields an incomplete and potentially misleading account of conflict-driven cooperation. The onset, persistence, and consequences of conflict are endogenous to pre-existing cooperative capacity. Conflict acts as a reinforcing force where cooperative foundations have taken root, scaling and institutionalizing cooperation, while magnifying fragmentation and contributing to societal decline where these foundations remain weak or absent. A unified theory must therefore account jointly for the ecological origins of heterogeneous cooperative predispositions and for the subsequent forces that reinforced, institutionalized, or undermined them.

5. Rethinking the Arc of Cultural Evolution

The ascent of large-scale cooperation laid the foundations for technological progress, scientific inquiry, and the rise of cities, states, and empires. Yet cooperative capacity did not emerge uniformly across societies. Its origins preceded recorded history and were shaped gradually by ecological and subsistence conditions that favored distinct and enduring cooperative dispositions. In some regions, these conditions encouraged patience, reciprocity, and disciplined coordination, enabling cooperation beyond kinship; in others, ecological pressures kept coordination largely confined within the clan.

Conflict, along with hierarchical organization and growing demands for public infrastructure, played a significant role in shaping cooperation over the course of human existence, yet its effects were decisively conditioned by behavioral foundations rooted in long-run cultural adaptation. Conflict intensified cooperative capacity where such foundations existed and exposed latent vulnerabilities where they were fragile. In populations where cooperative dispositions had taken root, conflict, and the associated demands of hierarchy, extraction, and shared infrastructure, catalyzed their expansion into structured forms of collective organization. Conversely, in societies with weaker orientations toward cooperation, conflict was seldom advantageous, and when it occurred, it often intensified existing divisions, at times precipitating destructive outcomes and societal collapse. Seen through this lens, conflict functioned less as a generator of cooperation than as a force that revealed and amplified preexisting cultural variation.

Intergroup conflict and institutional development provided the arena in which preexisting cultural orientations toward collective action were consolidated and formalized. In populations where ecological adaptation had already cultivated patience, reciprocity, and the capacity for disciplined coordination, conflict and

institutional development channeled these orientations into codified norms, stable administrative structures, and broader systems of mutual obligation. In contrast, in settings in which such social propensities had not been formed, rallying groups for sustained collective action was far more challenging, and episodes of conflict frequently aggravated existing internal rifts rather than producing cohesion or durable organizational forms.

Exploring the empirical relationship between conflict and cooperation therefore poses formidable challenges. The onset of conflict is itself shaped by pre-existing cooperative predispositions, and observed associations between conflict and cooperation may therefore reflect reverse causality and forces that jointly govern cooperative capacity and the incidence of conflict. In the absence of a mapping of pre-existing cross-societal variation in cooperative predispositions, the effect of conflict on cooperation would remain elusive, as it would be infeasible to resolve the fundamental question of whether conflict amplified cooperation or merely unfolded disproportionately in societies in which cooperative predispositions had already crystallized.

6. Concluding Remarks

The rise of large-scale cooperation was deeply uneven and contingent on pre-existing cultural foundations. It unfolded as a two-phase process. In the foundational phase, cultural evolution generated uneven capacities for coordination across societies, whereas in the reinforcing phase, intergroup conflict, political stratification, and the growing demand for shared infrastructure acted upon this uneven terrain, strengthening cooperation where cooperative foundations had taken root while revealing fragility where they were weak or absent. Rather than treating intergroup conflict, political stratification, and the growing demand for shared infrastructure as independent drivers of cooperation, the proposed analytical framework views them as endogenous expansionary forces that operated on pre-existing, yet unevenly distributed cooperative predispositions. These forces revealed, magnified, and selected among inherited cultural orientations toward cooperation, while amplifying fragility and division where cooperative foundations had yet to crystallize. The proposed framework therefore accounts for the coexistence of enduring institutional formation alongside episodes of recurrent societal collapse across human history.

References

- Arbatli, C. Eren, Quamrul Ashraf, Oded Galor, and Marc Klemp. 2020. Diversity and Conflict. *Econometrica* 88(2): 727–797.
- Ashraf, Quamrul, and Oded Galor. 2011. Dynamics and Stagnation in the Malthusian Epoch. *American Economic Review* 101(5): 2003–2041.

- Ashraf, Quamrul, and Oded Galor. 2013. The 'Out of Africa' Hypothesis, Human Genetic Diversity, and Comparative Economic Development. *American Economic Review* 103(1): 1–46.
- Boyd, Robert, and Peter J. Richerson. 1985. *Culture and the Evolution of Human Cooperation*. Chicago: University of Chicago Press.
- Boyd, Robert, and Peter J. Richerson. 2005. *The Origin and Evolution of Cultures*. New York: Oxford University Press.
- Bowles, Samuel, and Herbert Gintis. 2011. *A Cooperative Species: Human Reciprocity and Its Evolution*. Princeton: Princeton University Press.
- Carneiro, Robert L. 1970. A Theory of the Origin of the State. *Science* 169(3947): 733–738.
- Fehr, Ernst, and Simon Gächter. 2002. Altruistic Punishment in Humans. *Nature* 415(6868): 137–140.
- Galor, Oded. 2005. From Stagnation to Growth: Unified Growth Theory. Pages 171–293 in Philippe A. and Steven D. (eds.) *Handbook of Economic Growth*. Elsevier.
- Galor, Oded. 2010. The 2009 Lawrence R. Klein Lecture—Comparative Economic Development: Insights from Unified Growth Theory. *International Economic Review* 51(1): 1–44.
- Galor, Oded. 2011. *Unified Growth Theory*. Princeton: Princeton University Press.
- Galor, Oded. 2022. *The Journey of Humanity: The Origins of Wealth and Inequality*. New York: Penguin Press.
- Galor, Oded. 2025. Unified Growth Theory: Roots of Growth and Inequality in the Wealth of Nations. *Annual Review of Economics* 17: 196–216.
- Galor, Oded, and Marc Klemp. 2019. Human Genealogy Reveals a Selective Advantage to Moderate Fecundity. *Nature Ecology & Evolution* 3: 853–857.
- Galor, Oded, Marc Klemp, and Daniel C. Wainstock. 2026. *Ancestral Diversity and the Dynamics of Cultural Evolution*. Working paper, Brown University.
- Galor, Oded, and Stelios Michalopoulos. 2012. Evolution and the Growth Process: Natural Selection of Entrepreneurial Traits. *Journal of Economic Theory* 147(2): 759–780.
- Galor, Oded, and Omer Moav. 2002. Natural Selection and the Origin of Economic Growth. *Quarterly Journal of Economics* 117(4): 1133–1191.
- Galor, Oded, and Ömer Özak. 2016. The Agricultural Origins of Time Preference. *American Economic Review* 106(10): 3064–3103.
- Galor, Oded, and Slava Savitskiy. 2022. *Climatic Roots of Loss Aversion*. Working paper.
- Galor, Oded, Ömer Özak, and Assaf Sarid. 2025. Roots of Cultural and Linguistic Traits. *Economic Journal* (forthcoming).
- Henrich, Joseph. 2016. *The Secret of Our Success: How Culture Is Driving Human Evolution, Domesticating Our Species, and Making Us Smarter*. Princeton: Princeton University Press.

- Henrich, Joseph, Peter J. Richerson, and Robert Boyd. 2016. Cultural Group Selection, Coevolutionary Processes, and Large-Scale Cooperation. *PNAS* 113(23): 6388–6395.
- Olson, Mancur. 1993. *Dictatorship, Democracy, and Development*. American Political Science Review 87(3): 567–576.
- Ostrom, Elinor. 1990. *Governing the Commons: The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.
- Richerson, Peter, and Robert Boyd. 2005. *Not by Genes Alone: How Culture Transformed Human Evolution*. Chicago: University of Chicago Press.
- Sober, Elliott, and David Sloan Wilson. 1998. *Unto Others: The Evolution and Psychology of Unselfish Behavior*. Cambridge, MA: Harvard University Press.
- Talhelm, Thomas, Xuemin Zhang, Shigehiro Oishi, Chen Zou, Shimin Chen, Xiaoyun Duan, Xinyuan Lan, and Kaiping Peng. 2014. Large-Scale Psychological Differences Within China Explained by Rice Versus Wheat Agriculture. *Science* 344(6184): 603–608.
- Turchin, Peter. 2003. *Historical Dynamics: Why States Rise and Fall*. Princeton University Press.
- Turchin, Peter. 2006. *War and Peace and War: The Rise and Fall of Empires*. New York: Penguin Press.
- Turchin, Peter. 2025. *The Great Holocene Transformation: What Complexity Science Tells Us about the Evolution of Complex Societies*. *Chaplin: Beresta Books*.
- Turchin, Peter, Daniel Hoyer, Thomas E. Currie, Fabio Zaina, Charlie M. Brummitt, Kevin Feeney, Elmira Akhmetzhanova, et al. 2015. *Seshat: Global History Databank*. University of California eScholarship Repository. <https://escholarship.org/uc/item/9qx38718>
- Turchin, Peter, and Stefan Grohmann. 2020. *An Introduction to Seshat: Global History Databank*. *Journal of Cognitive Historiography* 3(1–2): 1–24.

