

The Evaluative Niche Hypothesis

Scott Partington¹

¹Department of History and Philosophy of Science, University of Cambridge, Cambridge, UK

*Corresponding author: Scott Partington; sp933@cam.ac.uk

Abstract

Human culture is distinctive in scope: tools, clothing, music, medicine, and beyond. Theorists explain this by appealing to “sophisticated” cognitive capacities, like causal understanding, or to “blind” selective processes, like unreflective copying. Another possibility is this: even if individuals cannot grasp *why* a tradition is effective, they can often register *that* it is effective. I argue that this evaluative capacity best explains why human culture is wide-ranging. In tandem, I propose *the evaluative niche hypothesis*, according to which human cultural scope owes to gradual refinements in a conserved capacity for goal-directed action, not “sophisticated,” human-unique cognition nor “blind” cultural selection.

1. Introduction

A cultural tradition is *cumulative* when it is not merely transmitted, but maintained and modified over time (Buskell 2022; Buskell and Tennie 2025). For humans, cumulative culture has an exceptionally wide scope: tools, food preparation, clothing, shelter, music, medicine, navigation, legal codes, and beyond (Boyd 2018; Henrich 2016; Morgan and Feldman 2024). In other species, perhaps the clearest examples are humpback whale songs that accumulate in complexity (Allen et al. 2018) and savannah sparrow songs that increase in salience (Williams et al. 2022). These are striking cultural achievements, though limited to the domain of songs. Whales don’t design high fashion, and sparrows don’t write legal codes. The last common ancestor of *Homo* and *Pan* didn’t do these things either. And yet we do.

What explains this difference in cultural scope between us and other species? Some theorists point to the evolution of “sophisticated and smart” cognitive capacities: language, theory of mind, causal reasoning, etc. (Barrett et al. 2007; Pinker 2010). By contrast, the influential *cultural niche hypothesis* holds that human cumulative culture largely owes to “blind and dumb” selective processes; in particular, an unreflective tendency to copy the beliefs and practices of others (Boyd et al. 2011; Henrich 2016).

Critics don’t deny that blind cultural selection can occur, but they do deny that human culture typically accumulates through a process like unreflective copying (Claidière et al. 2014; Sterelny 2024). Indeed, the above options—“blind and dumb” vs. “sophisticated and smart”—hardly exhaust the theoretical space. Another possibility is this: even if individuals cannot grasp *why* a new tradition is effective, often they can still register *that* it is effective (cf. Chellappoo 2022; Lewens 2024; Singh 2022; 2025; Sperber

1996). On this picture, cumulative traditions emerge through a process that is somewhat blind, yet far from dumb.

With this paper, I side with the critics. In particular, I argue that a capacity to register effectiveness offers the best explanation of why human culture is so wide-ranging (sect. 3). However, the most developed account of this capacity, due to Manvir Singh (2022, 2025), leaves open a key question (sect. 4): Why can humans, but not other primates who share the same basic cognitive architecture, produce culture of such wide scope? My proposed answer: hominins evolved uniquely *precise* value representations, transforming a system for goal-directed action into a capacity to create open-ended, cumulative culture (sect. 5). I call this *the evaluative niche hypothesis* and argue that it meets standard desiderata for good evolutionary accounts (cf. Planer and Sterelny, 2021). To begin, I clarify how human culture has an open-ended scope (sect. 2).

2. Open-ended, Cumulative Culture

In a recent article, Thomas Morgan and Marcus Feldman (2024) argue that human cumulative culture is distinctive in its *range of heritable variation*.¹ They motivate this idea by contrasting human culture with other forms of non-genetic inheritance. Epigenetic changes, for instance, can induce the water nymph *Daphnia cucullata* to develop an armored helmet, but not an open menu of alternative defenses (Agrawal et al. 1999). Human culture isn't so constrained by our biology. When long sea voyages exposed our inability to synthesize vitamin C, for example, we learned to take citrus juice as a remedy. This point generalizes, as Morgan and Feldman make vivid: "Although humans have not evolved a third arm, we are nonetheless sufficiently flexible to use one" (Morgan and Feldman, 2024, 34).

While other animals can create cumulative culture, Morgan and Feldman argue that their traditions remain limited in scope. Humpback whale songs accumulate in complexity across breeding seasons (Allen et al. 2018), and humpbacks' lobtail feeding practices are perhaps another, "marginal" cumulative tradition (Allen et al. 2013; Buskell and Tennie 2025). But whales don't seem able to create new traditions across their entire behavioral repertoire in the way humans can. A similar point applies to chimpanzees, who can create traditions in tool-making (Boesch et al. 2020), grooming (Van Leeuwen 2021), and gestural communication (Liebal et al. 2019), yet their cultural repertoire remains limited relative to ours.

Broadly, Morgan and Feldman's proposal is on the right track. But focusing on the "range of heritable variation" risks conflating two dimensions of cultural scope that come apart. To illustrate, imagine a hypothetical species—the "Depths"—who make spears and only spears, but whose designs accumulate indefinitely: sharper tips, improved balance, etc. Compare this with a different species—the "Breadths"—who develop cumulative traditions across many domains (e.g., spears, pottery, baskets, shelters, etc.), yet accumulation stalls out quickly within each. Both Depths and Breadths display something that could be called "open-ended scope," but neither looks like the human case. Indeed, humpback whales are closer to the Depths, with continual refinement in the domain of songs. And perhaps chimpanzees are more like the Breadths: traditions across a wide range of domains, with short genealogies of accumulation.

¹ A similar idea is discussed in Sterelny (2001) and perhaps implicit in Tennie et al. (2009).

The distinctive feature of human culture is that its scope combines both depth *and* breadth. Our ancestors didn't just make better spears; they also made pottery, baskets, shelter, music, medicine, etc.—and our cultural repertoire still continues to expand. Moreover, within each domain, there is no obvious ceiling on accumulation: how effective technology becomes, how elaborate art, how detailed medical knowledge, etc. Given this, I'll understand *open-ended scope* in a way that separates these dimensions:

Open-ended scope: A cumulative culture has an *open-ended scope* when, for any stage of accumulation, traditions can both (i) accumulate further within a behavioral domain and (ii) expand across new behavioral domains.

With this in place, we can turn to the question of how cumulative traditions emerge.

3. Understanding, Copying, and Evaluating

On one familiar picture, cultural innovations are products of intentional design: new traditions emerge because individuals understand *why* a new variant is effective (Pinker 2010). For example, Edison's telephone design made a series of intentional modifications to an earlier design by Reiss, improving the clarity and range of voice transmission (Lewens, 2024, 30–32).

However, as Joseph Henrich (2016; 2021) has emphasized, this *understanding route* doesn't always feature in the emergence of cumulative traditions. For example, the Tukanoan's procedure for detoxifying manioc includes a 48-hour waiting period before baking it into *casabe* (a bread). This mitigates health effects that are long-term and chronic—and thus extremely difficult to link with differences in waiting time. So the procedure is highly effective, but not because anyone understands the causal mechanism. For Henrich, there is a general lesson: “our (individual) problem-solving skills are nowhere near powerful enough to assemble the stunning array of tools and practices that are responsible for our ecological dominance” (Henrich 2021, 382). Since the understanding route places implausibly strong demands on insight into causal structure, it's not a viable explanation of why humans can create open-ended, cumulative culture.

The cultural niche hypothesis presents a different picture: culture accumulates because individuals tend to adopt the beliefs and practices of others around them (Boyd et al. 2011). It's clear how this *copying route* maintains existing traditions. By copying their mothers, Tukanoan daughters can learn how to process manioc. What's less clear is how copying generates *new* traditions (Lewens, 2024, 53–64). On pain of regress, the first woman to wait 48 hours couldn't have copied this behavior from her mother. But say she waited once through sheer chance. Why would she do it again and again, such that her daughters could learn to do the same? By hypothesis, she can't register the benefits of waiting. So why would she persist? Any “blind” copying process would struggle to explain this.²

This raises a *problem of origination* for strongly selectionist analogies between biological and cultural evolution (cf. Lewens, 2024, 53). Even if individuals need not

²Note that copying could perhaps explain the emergence of new traditions in limited domains; Sterelny (2024) suggests ritual dancing as a plausible candidate. But, even then, explanations that rely on copying still confront grain-of-analysis issues (Charbonneau 2020; Lewens 2024).

understand the benefits of a new tradition, there still has to be some plausible account of why individuals bother to adopt that tradition in the first place (cf. Morin 2016; Sperber 1996). This problem applies to both cultural depth and breadth. A population of perfect imitators can preserve the same spear-making technique indefinitely. But no amount of copying that technique will, by itself, generate pottery, baskets, shelters, music, or medicine. So while the copying route may sometimes contribute to cultural accumulation, like the understanding route, it is not plausible as a general explanation of open-ended scope, either.

All of this motivates a third possibility: even if individuals cannot understand *why* a new cultural variant is effective, they can still register *that* it is effective. For example, Tim Lewens (2024, 61–62) notes that waiting 48 hours ensures casabe has a “sour-dough” taste that Tukanoan people prefer (see also Mercier and Morin 2019). One need not understand the chemistry of cyanide to notice that bread tastes better. Kim Sterelny (2017, 45) makes a similar point about compound-tool adhesives: either a spearhead sticks to the shaft, or it doesn’t. And that’s enough to guide continual refinement without understanding the underlying causal mechanisms. Indeed, as Azita Chellappoo (2022) argues more generally, when individuals can register effectiveness, a capacity for goal-directed action gives a better explanation for cultural accumulation than blind selection.

Registering that a new variant is effective can drive accumulation within a domain, and registering that a new kind of activity is worth pursuing can drive expansion across domains. Of the candidate options, then, this *evaluative route* is best positioned to address the problem of origination and thus explain why human culture has an open-ended scope. Accordingly, the rest of this paper focuses on the evaluative route.

4. The Cognitive Basis of the Evaluative Route

To date, Manvir Singh (2022, 2025) has given the most detailed account of the cognitive architecture underlying the evaluative route. Singh’s account has two main components. The first concerns how goals and actions are *organized* in cognition. The second concerns how plans are *evaluated* in cognition. I’ll introduce both components (sect. 4.1.) before arguing that the second is a more plausible bottleneck on cultural scope (sect. 4.2.).

4.1. Hierarchical plans and subjective selection

Much research in cognitive science shows that goals and action representations are organized as *hierarchical plans* (Botvinick et al. 2009; Gallistel 2013) (Figure 1). At the top of the hierarchy are highly abstract, *superordinate* goals: e.g., acquire food, security, sex, status, etc. Each controls a set of *subordinate* goals that either direct behavior or further sub-goals. So a hierarchical plan unfolds roughly as follows: a superordinate goal (e.g., acquire food) becomes active, which activates a sequence of subordinate goals (e.g., go to the apple tree, shake the branch, etc.). Importantly, subordinate goals can also decompose into a further sequence of sub-acts (e.g., grab the branch, pull the branch, etc.). An individual may be consciously aware of these goal and action representations, but she doesn’t have to be—in what follows, all talk of cognitive representation and processing can be understood in a sub-personal way.

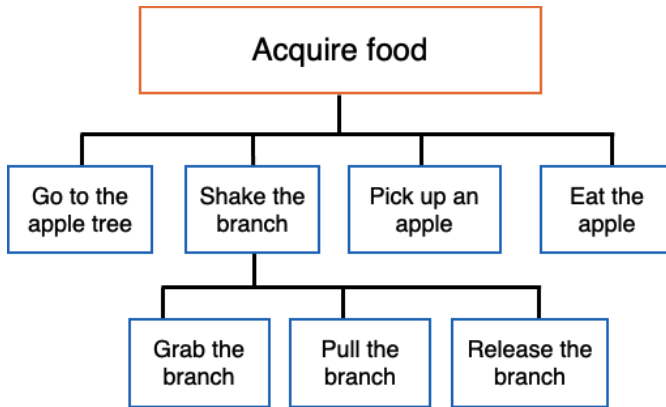


Figure 1. A hierarchical plan.

There is a good deal of behavioral and neuroscientific evidence for hierarchical plans; of particular relevance here is that a homologous neural system is found in other primates (see Planer 2023, 4–6, 10–12 for discussion). Behaviorally, too, it's clear that other great apes can learn internally complex action sequences: in nut cracking, termite fishing, nest building, and more. For example, Byrne (2007) gives a detailed analysis of how chimpanzees eat *Saba* fruit, decomposing the process into an elaborate sequence of sub-acts: acquire item, open fruit, make smaller if too big, remove shell, tear section open, extract pulp, spit out debris, etc.

Singh's key idea is linking the creation and retention of hierarchical plans to the process of cultural accumulation. On his account, individuals tend to create and retain hierarchical plans that *seem to best achieve their goals*. The basic idea is that individuals can represent the value of plans—i.e., how effective a plan seems at achieving a goal—and retain plans that are represented as more valuable. For example, an individual can gauge whether changes to her spear-making plan result in a sharper spear. Or she can observe others' spear-making technique, see that it's effective, and adopt that plan for herself. Crucially, this isn't blind copying. The learner has to register that a candidate plan seems effective, not just that others are following it.

Singh calls this process *subjective selection*. It is *selection* in the sense that individuals retain some plans and discard others. And it is *subjective* because what matters is that individuals represent plans as effective, not whether those plans actually are effective. On this picture, cultural traditions accumulate as “people keep what seems to work and drop what doesn't” (Singh, 2022, 270).

4.2. Organization or evaluation?

Can our capacity to represent and evaluate hierarchical plans explain the open-ended scope of human culture? Singh suggests so:

“Whether we consider chairs, brownies, hammers, igloos, rain magic, shamanism, bows-and-arrows... cultural products of all kinds develop as people preferentially adopt culture that seems to give them what they want.” (Singh, 2022, 278).

As it stands, though, one issue with this idea is that other primates can also represent and select hierarchical plans based on their effectiveness (see, e.g., chimpanzees' plan for extracting Saba). But other primates don't have open-ended cultural breadth. Likewise, humpback whale songs are hierarchically composed of themes and smaller units (Allen et al. 2018), showing a capacity for hierarchical representation. But humpback whales don't have open-ended culture, either.

So, the key question now becomes: *how* does the capacity to represent and evaluate hierarchical plans differ in humans and other animals? Morgan and Feldman (2024, 35) suggest that differences in the complexity and processing of hierarchical plans—e.g., nesting complexity, how long plans can be held in memory, how accurately plans are represented, etc.—are well-positioned to explain differences in cultural scope. These candidate differences relate to the *organization* component of Singh's account. But I suspect it'd be more productive to look for differences in the *evaluation* component. After all, no amount of organizational complexity can generate cultural breadth on its own. A species like humpback whales could be adept at representing hierarchically complex songs, adjusting them on the fly, holding them in memory for long periods, etc. But its culture would still be restricted to the domain of songs.

Note there is an important asymmetry here: organizational capacities expand which plans can be represented, but they don't control which plans to select and retain as effective. So, even a highly sophisticated organizational capacity can't make up for an inability to register that a new goal, in a new domain, is worth pursuing. This points to a gap in Singh's account: it doesn't explain why humans are able to register that a new goal is worth pursuing in the first place. In what remains, I suggest the key lies in a feature of subjective selection that Singh doesn't examine: its representational *precision*.

5. The Evaluative Niche Hypothesis

5.1. Evaluative precision and the bounds of cultural scope

Subjective selection favors variant *A* over variant *B* just in case *A* is represented with greater value than *B*: i.e., $V(A) > V(B)$. When two variants have equal value, neither is favored. This matters because cultural accumulation requires a *ratchet*, or some mechanism that produces directional change (Tennie et al. 2009; Tomasello 1999). For the ratchet to work, the system has to register distinctions in value. Think of this like labeling plans with colored Post-It notes. Each time the agent tries a new plan and learns its value, the system labels that plan with a note: red for bad values, green for good values, with darker shades for larger magnitudes. The *precision* of this system is determined by how many unique values can be represented—the number of uniquely colored Post-It notes, if you will. A system with three labels can make coarse distinctions (e.g., *good*, *neutral*, *bad*), while a system with more labels can make finer-grained distinctions (e.g., in a range [-K, K]).

To illustrate, suppose Sally is trying to make a shelter that stays dry when it rains, and she can register only three values: *good*, *neutral*, *bad*. First she builds a shelter from loose branches—it's *bad*, the rain gets in. Next, she tries packing mud into the gaps, which works out fine, but not great. She labels that plan as *neutral*. Finally, she tries layering leaves before packing the mud. This plan is *good*. With three variants registered at three different values, the ratchet works fine. But suppose Sally tries angling the leaf layer, which, in fact, proves most effective yet. The problem is that a previous variant is

already labeled as *good*, the top value that can be assigned. So there is no way to register that $V(\text{angled leaves}) > V(\text{flat leaves})$. For Sally, subjective selection ends here.

This constraint is due to evaluative precision, not space in memory per se. One might think Sally could discard her worst plan, free up a label, and reassign values, making the top value available for the new plan. But to reassign values correctly, Sally must already be able to discriminate that $V(\text{angled leaves}) > V(\text{flat leaves})$, which is exactly the distinction her system can't register. If instead Sally *pre-emptively* forgets ineffective plans and reassigns values among remaining candidates, this could ensure the top value stays available for whatever comes along. Pre-emptive forgetting has costs (e.g., wasting time and other resources "rediscovering" ineffective plans), and note forgetting also constrains an agent's cultural repertoire (i.e., limiting the range of available plans to the range of discriminable values). But the deeper problem arises when we consider the expansion of cultural breadth.

So far, all of this has occurred within a single behavioral domain. Sally gets better at making shelters, and then she stops getting better. But the same constraint applies *across* domains too. Suppose Sally has already developed a good shelter, a decent technique for finding water, and an effective way to keep a fire going overnight. Each is a subordinate goal under something like *staying alive tonight*. Now she notices that a certain branch can be fashioned into a spear. Opening this new domain amounts to activating a new subordinate goal, and that is itself an evaluative act. Sally has to register that spear-making is more valuable for *staying alive tonight* than continuing to refine her existing techniques; she needs requisite evaluative precision. The same constraint that limited depth now limits breadth—and here, pre-emptive forgetting would dismantle the ratchet entirely. If Sally forgets the goal of making a shelter so that she can make a spear, she'll lose a proven cultural tradition (e.g., her angled leaves technique) with no mechanism to recover it.

Putting all of this in more general terms: let R denote the number of discriminable value representations available to the agent. Cultural depth is bounded by R and the number of variants N in the agent's repertoire: when $N + 1 \geq R$, at least two variants must share a value representation (by the pigeonhole principle³), and selection between them is neutral. Cultural breadth is bounded by R and the number of subordinate goals G : when $G + 1 \geq R$, at least two goals must share a value, and selection between them is neutral. For cultural accumulation to be open-ended, both of these ceilings must be avoided indefinitely. This requires $R > N + 1$ and $R > G + 1$ for any repertoire size that might develop over an agent's lifespan. Or, using the terms from sect. 4.2., you can think of it this way: the precision of the evaluative system has to outstrip the range of plans that the organization system could develop.

A note on what this argument implies. Many cognitive differences between humans and other species plausibly *contribute* to differences in cultural scope: language, working memory, causal reasoning, etc. But evaluative precision is a *binding constraint*: it sets a limit on cultural scope, no matter what else is in place. This owes to the asymmetry between capacities that expand what plans can be represented and the capacity

³So named because if you put $n + 1$ pigeons into n holes, then at least one hole has more than one pigeon. Of course, value coding in brains may not be literally discrete. So my use of the pigeonhole principle here might seem like a dubious modeling choice. But it still makes sense to understand continuous systems as having finite representational precision, since noise in encoding processes will render values closer to some threshold indiscriminable. In these terms, R could be understood as the parameter setting that threshold.

to evaluate them. Capacities like language, working memory, and causal reasoning expand what plans can be represented. But they don't control which plans to keep and which to discard. That process bottlenecks through evaluative precision. So however important language, working memory, causal reasoning, etc. are, such capacities cannot compensate for low evaluative precision.

5.2. A new hypothesis

All of this suggests a new hypothesis:

The evaluative niche hypothesis: Hominins evolved uniquely precise value representations, transforming an otherwise conserved system for goal-directed behavior into a capacity to create open-ended, cumulative culture.

This hypothesis directly addresses the origination problem (sect. 3). With requisite evaluative precision, individuals can register that new variants and new goals are worth pursuing, even when their cultural repertoires are already large. Hence cultural scope can continue expanding via Singh's algorithm: keep what seems to work, drop what doesn't.

The selective advantage of evaluative precision is both straightforward and incremental. An individual with $R = 3$ can rank three variants but cannot detect that a fourth improves on the current-best. A descendant with $R = 4$ can detect one more improvement; $R = 5$ one more still; you can see where this is going. At each step, a small increase in precision yields a small but consistent advantage: a more precise agent can detect marginal improvements that a less precise agent would miss. This is exactly the kind of incremental payoff structure that natural selection can exploit, without requiring any discontinuous change(s) in cognitive architecture.

Moreover, there is a plausible co-evolutionary feedback loop here (cf. Sterelny 2012, 2021). Higher precision enables a broader repertoire. A broader repertoire creates more options to evaluate, generating selection pressure for still higher precision, and so on. This parallels the cultural niche hypothesis, where better social learning enables more complex culture, which selects for better social learning (Boyd et al., 2011). But the loop here is between evaluative capacity and cultural scope. This is what makes "niche" in "evaluative niche" do genuine conceptual work: a broader cultural repertoire creates a richer evaluative environment, which in turn selects for more of the very precision that produced it.

Indeed, preliminary evidence suggests that humans have a capacity for greater evaluative precision than other primates. Value-encoding neurons in monkey orbitofrontal cortex (OFC) undergo *range adaptation*: firing rates rescale to whatever option set is currently available (Padoa-Schioppa 2009). This maximizes discrimination within any given choice set but destroys the information needed for cross-set comparison. To illustrate: a forager whose value representations rescale locally can always pick the best option in front of her, but has no basis for comparing the best at location A (30 units) with the best at location B (300 units), since both evoke a maximal firing response. For an animal that eats as it goes, this is an optimal coding strategy. But it also effectively sets an accumulation ceiling on foraging plans: the forager's value representations give no reason to select a plan to forage at location B instead of location A.

By contrast, FitzGerald et al. (2009) found that activation in human OFC tracks the *magnitude* of the value difference between options—not merely which is better, but by how much, and doing so across different types of goods. A forager with this format of value representations could register that location B (300 units) is more fruitful than location A (30 units) and plan accordingly. The tentative contrast, then, is between imprecise, context-dependent coding in monkeys, versus a human capacity to employ a more precise and context-stable code.

Of course, a great deal of empirical support is still needed—in particular, more systematic cross-species comparisons, ideally with other great apes. But the foregoing discussion shows, albeit in sketch form, that the evaluative niche hypothesis meets standard desiderata for evolutionary accounts (Planer and Sterelny 2021): (i) it is gradualist and incremental in specifying the changes from ancestral to modern humans; (ii) it involves a baseline capacity supported by independent evidence; (iii) each step posits minor changes in the target mechanism(s), not depending on very improbable events; (iv) it is congruent with the dynamism and variability of hominin environments; and (v) the account makes testable predictions.

This puts a new explanation of human cultural scope on the table, one that doesn't appeal to "sophisticated" capacities (language, causal reasoning, etc.) or neglect individual insight by invoking "blind" selective processes. On this picture, human cultural scope owes to gradual changes in something much more ancient and widespread in the animal kingdom: a capacity to register that some behaviors are better than others for attaining goals.

References

- Agrawal, Anurag A., Christian Laforsch, and Ralph Tollrian. 1999. "Transgenerational Induction of Defences in Animals and Plants." *Nature* 401 (6748): 60–63.
- Allen, Jenny A., Ellen C. Garland, Rebecca A. Dunlop, and Michael J. Noad. 2018. "Cultural Revolutions Reduce Complexity in the Songs of Humpback Whales." *Proceedings of the Royal Society B: Biological Sciences* 285 (1891). <https://royalsocietypublishing.org/rspb/article/285/1891/20182088/84825>.
- Allen, Jenny, Mason Weinrich, Will Hoppitt, and Luke Rendell. 2013. "Network-Based Diffusion Analysis Reveals Cultural Transmission of Lobtail Feeding in Humpback Whales." *Science* 340 (6131): 485–88. <https://doi.org/10.1126/science.1231976>.
- Barrett, H. Clark, Leda Cosmides, and John Tooby. 2007. "The Hominid Entry into the Cognitive Niche." In *The Evolution of Mind: Fundamental Questions and Controversies*. The Guilford Press.
- Boesch, Christophe, Ammie K. Kalan, Roger Mundry, et al. 2020. "Chimpanzee Ethnography Reveals Unexpected Cultural Diversity." *Nature Human Behaviour* 4 (9): 910–16.
- Botvinick, Matthew M., Yael Niv, and Andrew G. Barto. 2009. "Hierarchically Organized Behavior and Its Neural Foundations: A Reinforcement Learning Perspective." *Cognition* 113 (3): 262–80.
- Boyd, Robert. 2018. *A Different Kind of Animal: How Culture Transformed Our Species*. Princeton University Press. <https://doi.org/10.1515/9781400888528>.
- Boyd, Robert, Peter J. Richerson, and Joseph Henrich. 2011. "The Cultural Niche: Why Social Learning Is Essential for Human Adaptation." *Proceedings of the National Academy of Sciences* 108 (Supplement 2): 10918–25.
- Buskell, Andrew. 2022. "Cumulative Culture and Complex Cultural Traditions." *Mind & Language*.
- Buskell, Andrew, and Claudio Tennie. 2025. "Mere Recurrence and Cumulative Culture at the Margins." *The British Journal for the Philosophy of Science* 76 (1): 123–45. <https://doi.org/10.1086/717776>.
- Byrne, Richard W. 2007. "Culture in Great Apes: Using Intricate Complexity in Feeding Skills to Trace the Evolutionary Origin of Human Technical Prowess." *Philosophical Transactions of the Royal Society B: Biological Sciences* 362 (1480): 577–85.

- Charbonneau, Mathieu. 2020. "Understanding Cultural Fidelity." *The British Journal for the Philosophy of Science* 71 (4): 1209–33.
- Chellappoo, Azita. 2022. "When Can Cultural Selection Explain Adaptation?" *Biology & Philosophy* 37 (1): 2. <https://doi.org/10.1007/s10539-021-09831-0>.
- Claidière, Nicolas, Thomas C. Scott-Phillips, and Dan Sperber. 2014. "How Darwinian Is Cultural Evolution?" *Philosophical Transactions of the Royal Society B: Biological Sciences* 369 (1642): 20130368. <https://doi.org/10.1098/rstb.2013.0368>.
- FitzGerald, Thomas H. B., Ben Seymour, and Raymond J. Dolan. 2009. "The Role of Human Orbitofrontal Cortex in Value Comparison for Incommensurable Objects." *Articles. Journal of Neuroscience* 29 (26): 8388–95. <https://doi.org/10.1523/JNEUROSCI.0717-09.2009>.
- Gallistel, C. R. 2013. *The Organization of Action: A New Synthesis*. Psychology Press.
- Henrich, Joseph. 2016. *The Secret of Our Success*. Princeton University Press.
- Henrich, Joseph. 2021. "Cultural Evolution: Is Causal Inference the Secret of Our Success?" *Current Biology* 31 (8): R381–83.
- Lewens, Tim. 2024. "Cultural Selection." *Elements in the Philosophy of Biology*, ahead of print, June. <https://doi.org/10.1017/9781009539043>.
- Liebal, Katja, Christel Schneider, and Manuela Errson-Lembeck. 2019. "How Primates Acquire Their Gestures: Evaluating Current Theories and Evidence." *Animal Cognition* 22 (4): 473–86.
- Mercier, H., and O. Morin. 2019. "Blind Imitation or a Matter of Taste?[Blog Post]." Retrieved.
- Morgan, Thomas JH, and Marcus W. Feldman. 2024. "Human Culture Is Uniquely Open-Ended Rather than Uniquely Cumulative." *Nature Human Behaviour*, 1–15.
- Morin, Olivier. 2016. *How Traditions Live and Die*. Oxford University Press.
- Padoa-Schioppa, Camillo. 2009. "Range-Adapting Representation of Economic Value in the Orbitofrontal Cortex." *Journal of Neuroscience* 29 (44): 14004–14.
- Pinker, Steven. 2010. "The Cognitive Niche: Coevolution of Intelligence, Sociality, and Language." *Proceedings of the National Academy of Sciences* 107 (supplement.2): 8993–99. <https://doi.org/10.1073/pnas.0914630107>.
- Planer, Ronald J. 2023. "The Evolution of Hierarchically Structured Communication." *Frontiers in Psychology* 14 (September). <https://doi.org/10.3389/fpsyg.2023.1224324>.
- Planer, Ronald, and Kim Sterelny. 2021. *From Signal to Symbol: The Evolution of Language*. MIT Press.
- Singh, Manvir. 2022. "Subjective Selection and the Evolution of Complex Culture." *Evolutionary Anthropology: Issues, News, and Reviews* 31 (6): 266–80. <https://doi.org/10.1002/evan.21948>.
- Singh, Manvir. 2025. "Subjective Selection, Super-Attractors, and the Origins of the Cultural Manifold." *Behavioral and Brain Sciences*, July 1, 1–59. <https://doi.org/10.1017/S0140525X25100617>.
- Sperber, Dan. 1996. *Explaining Culture: A Naturalistic Approach*. Oxford: Basil Blackwell.
- Sterelny, Kim. 2001. "Niche Construction, Developmental Systems, and the Extended Replicator." In *Cycles of Contingency: Developmental Systems and Evolution*. MIT Press.
- Sterelny, Kim. 2012. *The Evolved Apprentice*. MIT press.
- Sterelny, Kim. 2017. "Cultural Evolution in California and Paris." *Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences* 62.
- Sterelny, Kim. 2021. *The Pleistocene Social Contract: Culture and Cooperation in Human Evolution*. Oxford University Press.
- Sterelny, Kim. 2024. "Cultural Evolution, Niche Construction and Ecological Inheritance." *The British Journal for the Philosophy of Science*, May 21, 731500. <https://doi.org/10.1086/731500>.
- Tennie, Claudio, Josep Call, and Michael Tomasello. 2009. "Ratcheting up the Ratchet: On the Evolution of Cumulative Culture." *Philosophical Transactions of the Royal Society B: Biological Sciences* 364 (1528): 2405–15.
- Tomasello, Michael. 1999. *The Cultural Origins of Human Cognition*. Harvard university press.
- Van Leeuwen, Edwin JC. 2021. "Temporal Stability of Chimpanzee Social Culture." *Biology Letters* 17 (5). <https://royalsocietypublishing.org/rsbl/article/17/5/20210031/62911>.
- Williams, Heather, Andrew Scharf, Anna R. Ryba, et al. 2022. "Cumulative Cultural Evolution and Mechanisms for Cultural Selection in Wild Bird Songs." *Nature Communications* 13 (1): 4001.