



HAL
open science

Did social cognition evolve by cultural group selection?

Olivier Morin

► **To cite this version:**

Olivier Morin. Did social cognition evolve by cultural group selection?. *Mind and Language*, 2019, 34 (4), pp.530-539. <10.1111/mila.12252>. <hal-04307686>

HAL Id: hal-04307686

<https://hal.science/hal-04307686v1>

Submitted on 26 Nov 2023

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons CC BY 4.0 - Attribution - International License

CRITICAL NOTICE

Did social cognition evolve by cultural group selection?

Olivier Morin 

Max Planck Institute for the Science of Human History, Jena, Germany

Correspondence

Olivier Morin, Max Planck Institute for the Science of Human History, 10, Kahlaische strasse, 07745 Jena, Germany.
Email: morin@shh.mpg.de

Abstract

Cognitive gadgets puts forward an ambitious claim: language, mindreading, and imitation evolved by cultural group selection. Defending this claim requires more than Heyes' spirited and effective critique of nativist claims. The latest human “cognitive gadgets,” such as literacy, did not spread through cultural group selection. Why should social cognition be different? The book leaves this question pending. It also makes strong assumptions regarding cultural evolution: it is moved by selection rather than transformation; it relies on high-fidelity imitation; it requires specific cognitive adaptations to cultural learning. Each of these assumptions raises crucial yet unaddressed difficulties.

KEYWORDS

cultural attraction, cultural evolution, language, mindreading, writing

1 | INTRODUCTION

Short as it is, *Cognitive gadgets* packs two books into one.¹ The first book is nested between the first and last chapters. There, Cecilia Heyes attacks the view that imitation, language, or other social learning mechanisms, are innate, domain-specific biological adaptations. This part is critical and empirical. The second book, split between the volume's beginning and its end, develops the claim that cultural learning arose through cultural evolution—more specifically, through cultural group selection. It is constructive and speculative. The first book is excellent, but it does not quite connect with the second one. The cultural evolutionary theory that underpins *Cognitive gadgets* is intriguing,

¹ (Heyes, 2018).

but sketchy; it remains disconnected from the book's empirical core. This review will briefly go over Heyes's empiricist critique of nativist social cognition, then focus at greater length on her cultural evolutionary hypothesis. I will argue that her middle chapters provide an interesting objection to some nativist theorizing in cognitive science, but that the book as a whole does not prove or ground the claim that social cognition evolved through cultural group selection—a claim examined at length when I focus on *Cognitive gadgets'* positive claims.

2 | AN EMPIRICIST TAKE ON SOCIAL COGNITION

At the core of the book is an overview of what the study of social learning can gain from adopting an empiricist, Lockean perspective (chapters 3 and 5–8). This approach is well known for attempting to explain complex cognitive skills from lean learning mechanisms, stipulating as few innate constraints as possible (Prinz, 2013). *Cognitive gadgets* focuses more specifically on the skills involved in cultural learning, like mindreading, imitation, or language. In Heyes's view, evolutionary psychology epitomises a tendency to view these capacities as rigidly innate, but her critique is not limited to that field. She started writing on these topics at a time when nativist theories were riding high. The view in vogue in the 1990s saw human cognitive development as strongly canalised. As the argument went, similar mechanisms develop early and similarly in most human children. Some, like face perception, mature so early and so consistently across individuals that the word “innate” did not seem unwarranted. Chomskyan linguistics was at its peak.

Times have changed: a replication crisis has come upon developmental psychology; generative grammar has come under attack; Bayesianism (one of *Cognitive gadgets'* notable absences) has deeply changed what it would mean for learning to be guided by innate constraints. Having defended empiricism when the odds in its favour were lowest, Cecilia Heyes reaps the rewards of a series of wise bets. The chapters on imitation and mindreading show her at her best: a precise critic, with sound empirical intuitions that sometimes prove prescient. Having defended an associationist theory of imitation for decades in the face of evidence for neonatal imitation, she is in an excellent position to draw conclusions from the recent refutation of these experiments. Her critique of the infant mindreading literature managed to sway this reader (initially a supporter of that research). Take, for instance, the reinterpretation² of a famous study claiming to detect mindreading through anticipatory looking in 18 months olds (Southgate, Senju & Csibra, 2007). When I first encountered this argument (Heyes, 2018), my initial reaction was to dismiss it as far-fetched and ad hoc. Indeed, I do not think that this interpretation was confirmed by the data that came up since; but in a way, this does not matter. The controversies surrounding attempts to replicate the study (most of them published after the book went to press) lend weight to Heyes's doubts about this study, and about others (Dörrenberg, Rakoczy & Liszkowski, 2018).

For all their punch, these engaging chapters do not necessarily bring the desired theoretical benefits. One reason is that evolutionary psychology has changed a lot since the 1990s. *Cognitive gadgets* repeatedly presents evolutionary psychology as wedded to a rigidly preformationist view of the mind.³ Yet recent overviews of the field (Barrett, 2015; Boyer, 2018) explicitly eschew strongly nativist positions. The latest versions of Sperber's “massive modularity” thesis (Sperber, 2005) incorporate Annette Karmiloff-Smith's “modularisation hypothesis” (Karmiloff-Smith, 1995) according to which mental skills, even the most automated and domain-specific, may spring from domain-general

² p. 157 sq.

³ p. 3–4; p. 12; p. 14; p. 31; p. 78. “Most evolutionary psychologists argue, assert, or merely assume that genetic evolution is the architect of the human mind.” (p. 12).

learning processes. The fact that specialised cognitive processes with dedicated neural resources could arise through learning, which Fodor (1983) allowed in theory but dismissed as unlikely, is now taken quite seriously.

Heyes may occasionally overstate her opposition to evolutionary psychology; but she does hold a rather extreme view of the importance of explicit cultural training in the development of language, imitation, and mindreading. Central to her argument is an analogy between mindreading and literacy: “mindreading is taught in much the same way as print-reading.”⁴ The arguments backing this claim are basically two.

First, linguistic input (specifically, conversations bearing on mental states), influences performance in the verbal tasks used to test “explicit” theory of mind. This is an interesting finding of recent research, but the fact that performance on a verbal task can be improved by verbal training is hardly a big surprise. (There are non-verbal tasks that test for mindreading skills, but according to Heyes, the kind of implicit mindreading revealed by such tasks is an entirely different capacity, which she calls “submentalising.”) In any case, literacy is quite different. Training does not merely make it easier to acquire: literacy simply never appears without it—and often fails to develop even with massive input.

Second, different developmental trajectories are seen in different societies. The components of mindreading may be acquired later, or in a different order, from one society to the next. This may be true, but proves little. The age of puberty varies dramatically from one social group to the next, not just because of genes and nutrition, but also for social reasons; for instance, girls with absent fathers reach menarche earlier (Boynton-Jarrett & Harville, 2012). Few would conclude that puberty is as cultural as reading, though, for many a good reason. One of them is that puberty is a human universal. Literacy is cultural in a much more substantial sense: most human societies in history were illiterate, and remained so until they were put into contact with a literate culture. Heyes does not deny that mindreading may be a human universal, and gives us no reason to think it is closer to literacy than to puberty.

This literacy analogy illustrates the book's main limitation. Heyes excels at criticising hard-line nativist accounts; but when proposing a constructive alternative, the book is at times vague, at times dogmatic.

3 | THE CULTURAL EVOLUTION OF SOCIAL COGNITION

Cognitive gadgets refuses to commit to a specific scenario for the rise of social cognition (what Heyes calls a “narrative theory”). Instead, Heyes identifies several mechanisms that must have played a part (a “process theory”). Although the book eschews narrative accounts, its “process theory” is only compatible with a narrow range of scenarios. Here is the one that seems, in my view, closest to the book's hypotheses:

Before cultural learning arose, humans had some culture, but it did not evolve in quite the same way that it does now. Cultural transmission relied on noisy channels—what the book calls “social learning mechanisms,” as opposed to high-fidelity “cultural learning mechanisms.” They were not very faithful. As a result, human social groups differed culturally in ways that were not always sharp or enduring. Yet groups—sets of people sharing cultural traits like a shared language, and cooperating together—did differ to some extent, and some were better able to produce, retain, or attract members. The conditions for some incipient kind of cultural group selection were present, but because cultural differences between groups were neither very sharp nor very stable, it did not have

⁴ p. 154.

much variation to feed on, nor could it rely on robust transmission mechanisms to stabilize it. In spite of this, cultural group selection did occur. In some groups, humans started (more or less randomly, at any rate without any foresight) to produce behaviours that made cultural transmission more faithful. This made these groups culturally more stable, and also more different from other groups. People started to mimic each other's gestures in great detail; to use conscious heuristics that caused everyone to choose the same models to imitate; to engage in mindreading and use language, two things that increase the flow of information between people and make high-fidelity transmission easier to achieve. This was not regular "social learning," but "cultural learning." The groups that engaged in cultural learning (as opposed to mere social learning) were better at producing, keeping, and attracting members. Several things could explain this greater success: perhaps cultural learning made it easier for them to retain and exploit the good ideas left by previous generations of group members; perhaps cultural homogeneity carried intrinsic benefits. Either way, cultural learning spread as the groups that engaged in it grew and attracted members. As cultural learning habits became, first widespread, then nearly universal, many cultural differences between human groups became sharper and more enduring. Cultural group selection now had enough fuel to move forward. Thus, cultural evolution itself produced the learning mechanisms that make it tick.

The next sections examine the main processes through which (according to Heyes) language, theory of mind, and imitation came about. They arose through cultural group selection; their evolution was driven by selection, not transformation; they were selected because they allowed the faithful transmission of cultural information, as distinct from other kinds of information. I will present objections to each of these claims.

4 | CULTURAL GROUP SELECTION

As we saw, language, theory of mind, imitation, are supposed to have evolved by cultural group selection (Zawidzki, 2013). The way the book defines it,⁵ cultural group selection results from competition between social groups, defined as social units sharing the same language and/or territory. This struggle has two dimensions. Groups struggle to survive, which means keeping or attracting members; they also spawn offshoot groups that may inherit their parent group's characteristics. If some cultural practice, widespread inside some social groups but not among others, helps those groups to survive or to spawn offshoots, and if other groups go extinct, that trait will be selected. The cultural evolution of "cognitive gadgets" was thus mainly driven by changes in the composition of human groups; these cultural innovations were adopted and transmitted by societies as wholes, not by individuals, and their fate was tied to the fate of these particular societies.

The rise of language or theory of mind left no record, but some other cognitive gadgets did. Consider literacy once again. Did it evolve by cultural group selection? Four civilizations at most invented writing independently. The Egyptian and Sumerian empires are long turned to dust, their languages dead or unrecognisable. The Maya empire is gone. None of these made any successful attempt at establishing lasting colonies. Meanwhile, something like the original Chinese civilization still endures. These facts, however, are almost irrelevant to the history of literacy. Most literates, today, do not speak Chinese. Egypt before its fall invented an alphabet that acquired a life of its own and quickly spread to civilisation that had no ties (however you define them: linguistic, geographical, demographic, institutional, or otherwise) with Pharaoh and his subjects. Fortunately for Western literates, the fall of Egypt—its empire, its language, its religion—did not in any way hinder the spread of

⁵ p. 198–203.

literacy. This bit of culture did not have to evolve at the sluggish pace of wars, conquests, and demographic expansion. It easily hopped from one group to the next. Nor was the adoption of literacy a particularly collective endeavour: it remained the preserve of a tiny minority until very recent times. A society does not usually become literate as a whole. Women's writing systems often differ from men's, merchant literacy differs from clerical literacy, and so on.

This is no isolated example: similar stories could be told about arithmetic, meditation, or other culturally evolved cognitive tools. Such examples leave cultural group selectionists with two options.

First option: Claim that modern history does not reflect the conditions that prevailed in our evolutionary past. This seems to me a risky path to follow. Few anthropologists would back, without balking, the claim that cultural diffusion was less likely to occur across group boundaries in pre-agricultural populations. Indeed, there are good reasons to think ancient human social life was almost designed to allow different groups to mingle and exchange. Primatology and comparative anthropology suggest that exogamy was a constant feature of human societies (Chapais, 2010): women exchange could cement tight political relationships between linguistically and culturally diverse groups. Institutions like Australia's moiety system also create linguistic diversity inside politically tight groups: Cultural, linguistic, political, and geographical ties multiply and overlap. The problem for cultural group selection is not merely that human societies have fuzzy boundaries: they have multiple, non-overlapping fuzzy boundaries; information is constantly exchanged across those.

The second option, taken by other defenders of cultural group selection, notably Richerson et al. (2016), consists in broadening cultural group selection until it includes processes of cross-cultural diffusion, like the spread of writing, as special cases. Heyes flirts with this position when she suggests that cultural group selection may benefit cultural practices, rather than social groups,⁶ or when she considers the copying of a group by other groups to be an aspect of cultural group selection.⁷ Making this move would considerably dilute the cultural group selectionist thesis. Its key claim, the view that changes in the composition of clearly defined social groups drives cultural evolution, would be effectively jettisoned, to be replaced by nothing specific.⁸

5 | IS CULTURAL EVOLUTION DOMINATED BY SELECTION?

One thing makes cultural group selection particularly attractive to Heyes: it is a squarely selectionist theory of culture. Evolutionary processes (biological or cultural) can be decomposed into two sorts of dynamics. Selection is the most well known: it is what Darwinian evolution often boils down to. An entity carrying trait A out-reproduces an entity carrying trait B. Reproduction being faithful and unbiased, the fact that the first entity out-reproduces the second leads to trait A invading the population. But trait A could also invade the population in a completely different way. Suppose that reproduction is, in fact, biased: entities carrying trait A, when they reproduce, tend to mutate, turning into B. In turn, B is less likely to turn into A. This process has been variously called transformation, "guided variation," or "attraction." (Here I call it "transformation"). It has nothing to do with selection: what out-reproduces what does not matter.

Formally speaking, the two processes each make a distinct and additive contribution to evolutionary dynamics (El Mouden, André, Morin & Nettle, 2014). Their respective importance hinges on the amount of bias introduced by mutations. "Mutations," here, include novel breakthroughs and insights

⁶ p. 201, paragraph 2.

⁷ p. 202 (beginning), and Heyes, personal communication.

⁸ This critique is developed in Morin 2016's comment on Richerson et al. (2017).

owed to a few individuals—what Heyes calls “intelligent design.” To the extent that intelligent design and transformation drive cultural evolution, selection is not required. For evolution to be entirely driven by selection, mutation needs to be entirely random, that is to say, blind to opportunities for adaptive change. No one, as far as I know, took this extreme position since Campbell⁹; but many models consider it an acceptable approximation. Richerson and Boyd (2005) make a selectionist argument when they claim that canoe-making evolved through a selection of randomly generated variations. Canoe-making, they argue, is too complex for human brains to have much useful insight into the process. Since nature (the argument goes) did not gift us with a perfect understanding of flotation, aerodynamics, etc., the rational strategies consists in imitating successful canoes, and letting cultural selection, not individual insight, do the work of coming up with good canoes. If we take it literally, this scenario sells human cognition short. People do not try to build stone canoes, or canoes with a hole in the middle. But that, in a way, is the point of the canoe argument: even if humans had no cognitive resources whatever, apart from a general capacity to imitate others, cultural selection could still come up with sophisticated adaptations that need no contribution from human insight.

Most cultural evolutionists are heirs to a selectionist approach, while acknowledging that selection cannot be the whole story. Recently, mainstream cultural evolution has acknowledged the importance of spontaneous invention and transformation (as “guided variation”), but these processes remain under-studied. (Critics have also argued that concepts like “guided variation” do not do justice to the importance of transformation—Buskell, 2017; Morin, 2016b). In their majority, cultural evolutionary models are purely selectionist. This privilege granted to selection has two main roots. First, cultural evolutionary models favour selection over transformation because most biological models do. A second reason is more philosophical: since Karl Popper and Donald Campbell, a prestigious intellectual tradition has argued that selection was a privileged path for scientific and cultural progress. Heyes, who worked with Campbell (*Cognitive gadgets*' dedicatee) is a proud representative of this second tradition. She seems to agree with the rest of the cultural evolution community that cultural selection is not the only possible evolutionary process.¹⁰ But when it comes to the evolution of cultural learning, Heyes is adamant: only selection could have played a part¹¹—selection conceived as a decentralized process driven by thousands of agents with little or no understanding of cognitive gadgets, not by a handful of foresighted inventors.¹²

At the risk of sounding like a Texan creationist, I find this dismissal of intelligent cultural design hasty. We know that transformative individual inventions played a key role in the history of the cognitive gadgets we know best; writing systems, for instance, are typically put together by a few people who draw on a pre-existing repertoire of symbols, and pair them with phonetic meanings (Houston, 2004). Cultural history abounds with cases where an invention process was concentrated in a few minds: radioactivity, blood circulation, and electricity. All these discoveries had precursors, of course, but they numbered in the dozens, not in the thousands.

So why does Heyes favour selection so exclusively? The reason seems purely metaphysical. She endorses a version of teleosemantics in which selection (biological or cultural) is the only possible source of intentionality that a naturalistic worldview can accommodate.¹³ A representation, in Heyes's view, can only be a representation of something if it was selected for that purpose; a

⁹ It is unclear whether Heyes follows Campbell on this point. I assume she does not. *Cognitive gadgets* cites and endorses Campbell's entire slogan, “Blind variation and Selective Retention” only once in a quotation (p. 33). Later on she removes the word “blind” from Campbell's formula.

¹⁰ See for example, p. 113.

¹¹ p. 201; p. 206.

¹² p. 113.

¹³ p. 28–29.

mechanism can only serve a function if selected to serve it. Heyes clearly admits that non-selectionist processes do play a role in cultural change; but it seems to be an ontologically inferior one. Her book often implies that non-selectionist processes are somehow less interesting, one reason being that they are less easy to capture in a Darwinian framework.¹⁴ It is hard to understand these passages as anything but an invitation to look for our keys under the selectionist lamplight.

6 | DOES CULTURAL TRANSMISSION NEED FAITHFUL MECHANISMS?

This commitment to selectionism leads Heyes to underscore the fidelity of cultural transmission.¹⁵ As Heyes notes,¹⁶ high-fidelity transmission makes little room for transformation, and so forces cultural variants to change in small steps. It limits the impact of smart or creative individuals. It makes cultural evolution reliant on the choices of the many rather than the inventions of the few. Selectionism does not require that cultural transmission be highly faithful, but the two views pair well. Provided, of course, that one buys the claim that cultural transmission is indeed so faithful that it leaves little room for insightful transformation.

There is room for doubt. Stable traditions can and do endure even while travelling through noisy transmission channels, even when they are distorted in systematic ways (see Morin, 2016a: ch. 4 for an overview of the evidence). Several mechanisms can ensure this. One is repeated transmission: even a noisy transmission procedure can result in accurate learning if applied many times, especially if several sources are involved (Enquist, Strimling, Erikson, Laland & Sjostrand, 2010; Strimling, Enquist, & Eriksson, 2009). Another is biased transformation: if most people tend to modify a set of practices in similar ways, they will converge on attractive cultural forms. There is now substantial experimental evidence for this sort of dynamic (Fehér, Wang, Mitra & Tchernichovski, 2009; Kalish, Griffiths & Lewandowsky, 2007). These studies show how systematically distorting a cultural practice in a consistent direction can make cultural transmission more stable than a general tendency to copy any input with high fidelity. As Kim Sterelny (Sterelny, 2017) put it, cultural transmission mechanisms are often conceived as “content-neutral” but “fidelity-sensitive”: copy your model exactly, whatever they do. But there is another way to conceive of the cognitive tools involved in passing on culture: they may be “fidelity-neutral” but “content-sensitive.” Such mechanisms can produce faithful transmission, but that is not their adapted function.

Cognitive gadgets does not take this argument on board. The epitome of cultural learning, in Heyes's view, is imitation—the prototype of a fidelity-sensitive, content-indifferent mechanism. She repeatedly insists on the fact that cultural learning is “specific,” meaning that it involves copying others down to the smallest components of their actions.¹⁷ Still, *Cognitive gadgets* admits that cultural evolution can occur even if cultural traits are not passed on as faithfully as genes.¹⁸ When discussing the role of repeated transmission from multiple sources, she is more ambiguous. One passage underlines the benefits of acquiring cultural practices from many different kinds of sources¹⁹; but another passage²⁰ argues that relying on a smaller number of models (“exclusive” cultural learning)

¹⁴ See for example, p. 113–114.

¹⁵ See for example, p. 86; p. 94; p. 105.

¹⁶ p. 113 sq.

¹⁷ p. 112.

¹⁸ p. 204.

¹⁹ p. 40–41.

²⁰ p. 112–113.

makes transmission more faithful too. Whatever her true position may be, Heyes allows that cultural evolution can get by with relatively low-fidelity transmission mechanisms.²¹ She also notes that demographic and social circumstances have an important impact on cultural evolution²²: cognitive adaptations for faithful social learning do not explain everything.

More specifically, *Cognitive Gadgets* argues that cultural transmission was not always as faithful as it is now. Paradoxical as this may sound, cultural evolution did not always depend on cultural learning. Cultural evolution once relied on “social”, not “cultural”, learning. Cultural learning is repeatedly defined as more faithful than social learning,²³ and for this reason more compatible with cultural selection processes.²⁴ Since cultural learning is itself a product of cultural evolution (the book's main claim), it follows that, once upon a time, cultural evolution relied on lower fidelity transmission. So what did higher fidelity cultural learning contribute to cultural evolution?

7 | COGNITIVE ADAPTATIONS TO CULTURAL TRANSMISSION

Heyes's answer is original. Cultural evolutionists usually stress the impact of high-fidelity transmission upon the conservation of useful skills (“cumulative culture”). This book takes a different angle: the rise of cultural learning “enhanced” or “enabled” the very mechanism of cultural group selection that made it appear in the first place. More specifically, cultural evolution became more selectionist: Darwinian models became better able at capturing it, because social learning was supplanted by cultural learning.²⁵ Daniel Dennett (2017) has argued that cultural evolution has been undergoing a process of “de-Darwinisation”: it has become less selectionist; imitation partly gave way to transformation. Heyes makes the exact opposite argument: there has been a “Darwinisation” of cultural evolution. Selectionist forces have become more powerful than transformative ones. This does not quite tell us why cultural group selection favoured the groups where imitation, theory of mind, or language, were widespread. Obviously, all sorts of good things flow from mastering language and theory of mind. The question is, which of these good things did they get selected for? According to *Cognitive gadgets*, these mechanisms (whatever other benefits they may bring) were selected for their role in cultural learning, as distinct from other kinds of information exchanges.²⁶ Were they?

There are various ways to set cultural information apart. Most authors believe that cultural information is found on long transmission chains that span many individuals and often endure across generations. Since they endure, some of these traditions allow useful improvements to accumulate over the long run, and some produce stable differences between human groups that may be recognised as distinct “cultures.” Language and theory of mind clearly play a role in building these transmission chains; but we also use them to handle information of a less enduring nature. A lot of human information exchange deals with the here-and-now, and will not become traditional. Our communicative skills have many uses besides cultural transmission. To claim that they evolved specifically to sustain

²¹ This is arguably a charitable interpretation. On page 268, in footnote 1, Heyes does write: “there is no reason to doubt that simple, ancient forms of social learning (...) can contribute to cultural inheritance. “Yet, in more prominent parts of the book, cultural learning is implied to be almost necessary for cultural evolution to occur.” For instance p. 3 (“cultural learning enables cultural inheritance”) and p. 43 (“Cultural learning allows ideas and behaviours to be inherited with sufficient fidelity for selection to operate”).

²² See Heyes's endorsement of “distributed inheritance” and “collective intelligence”: p. 41, p. 211–213. Also p. 112–113.

²³ p. 86, p. 112.

²⁴ P. 86, p. 105, 112–113.

²⁵ p. 86; p. 89; p. 105; p. 113.

²⁶ p. 86; p. 89; p. 268 note 1.

long transmission chains is far from trivial. It is like claiming that birds' feathers evolved specifically for flight, not as tools for thermoregulation or courtship displays. We know feathers serve many purposes today: singling out one of these as their original function is adaptationist speculation (Gould & Vrba, 1982). It could be right or wrong, but requires special evidence; the claim that language, theory of mind, imitation, evolved for culture, is no different.

The book does not provide the special evidence that this claim requires. That is mostly because Heyes did not expect contradiction here: in her view, all cultural evolutionists agree that culture exists because it is supported by specific adaptations; the only disagreement worth mentioning is whether the adaptations in question are biological or not. I beg to differ. I have argued, elsewhere, for the view that cultural transmission rests on run-of-the-mill capacities that evolved to allow us to exchange, indifferently, cultural and non-cultural information (Morin, 2016a). Cultural transmission does not need a separate lane, let alone an information superhighway. It travels the same roads as non-cultural information. The long transmission chains that span generations and make up culture reveal themselves to the bird's eye view of historians and anthropologists; but what people see is the ground level, where all socially transmitted information tends to look the same. Cultural traditions do not always come with their cultural tag attached—and it is not obvious why humans should care whether what they learn is culture, or simply useful social information. I am not alone in defending this view (Boyer, 2018; Claidière, Scott-Phillips & Sperber, 2014). These authors would actually agree with Heyes's main claim: there are no biologically hard-wired adaptations for cultural learning *qua* cultural. But that is because no special-purpose adaptations are needed, biological or cultural. In the right demographic and social conditions, cultural traditions naturally emerge as a by-product of normal communicative interactions, usually without a need for special-purpose cognitive capacities. Elsewhere, I have taken up the burden of proof for this view; for now I'll just note that it is more parsimonious than Heyes's cultural group selection hypothesis.

Cultural evolution needs more books like this one: books that take big theoretical gambles; books that do not give in to fudging or equivocation. Cecilia Heyes's speculative strategy makes her likely to err on some issues. But speculation is, at worse, harmless. At its best, it provides excellent conversation starters: they abound in this book. *Cognitive gadgets* takes clear and strong positions on nativism; on the respective weight of selection and transformation in cultural evolution; on the role of faithful imitation in cultural transmission. It beckons everyone else in the field to take as clear a stand. Here is mine. Language and theory of mind are unlikely to have evolved through cultural group selection. None of the evidence presented in the book points specifically to this scenario. I have argued that high fidelity copying is not as important to cultural transmission as Heyes takes it to be. It follows that cognitive adaptations for faithful social learning are not necessary to kick cultural evolution into motion. Regular capacities for information exchange, by no means specifically attuned to cultural information, suffice.

ORCID

Olivier Morin  <https://orcid.org/0000-0002-6216-1307>

REFERENCES

- Barrett, H. C. (2015). *The shape of thought: How mental adaptations evolve*. 1st. New York, NY: Oxford University Press.
- Boyer, P. (2018). *Minds make societies: How cognition explains the world humans create*. New Haven, CT: Yale University Press.

- Boynton-Jarrett, R. & Harville, E. (2012). A prospective study of childhood social hardships and age at menarche. *Annals of Epidemiology*, 22(10), 731–737.
- Buskell, A. (2017). What are cultural attractors? *Biology and Philosophy*, 32(3), 377–394.
- Chapais, B. (2010). *Primeval kinship: How pair-bonding gave birth to human society*. Cambridge, MA; London, England: Harvard University Press.
- Claidière, N., Scott-Phillips, T. & Sperber, D. (2014). How Darwinian is cultural evolution? *Philosophical Transactions of the Royal Society B*, 369(1642), 20130368.
- Dennett, D. C. (2017). *From bacteria to Bach and back: The evolution of minds*. 1st. New York, NY: W. W. Norton & Company.
- Dörrenberg, S., Rakoczy, H. & Liszkowski, U. (2018). How (not) to measure infant theory of mind: Testing the replicability and validity of four non-verbal measures. *Cognitive Development*, 46, 12–30.
- El Mouden, C., André, J. B., Morin, O. & Nettle, D. (2014). Cultural transmission and the evolution of human behaviour: A general approach based on the Price equation. *Journal of Evolutionary Biology*, 27(2), 231–241.
- Enquist, M., Strimling, P., Erikson, K., Laland, K. & Sjostrand, J. (2010). One cultural parent makes no culture. *Animal Behaviour*, 79(29), 1353–1362.
- Fehér, O., Wang, H. S. S., Mitra, P. & Tchernichovski, O. (2009). De novo establishment of wild-type song culture in the Zebra Finch. *Nature*, 459(7246), 564–568.
- Fodor, J. A. (1983). *The modularity of mind: An essay on faculty psychology*. Cambridge, MA: A Bradford Book/MIT Press.
- Gould, S. J. & Vrba, E. S. (1982). Exaptation—a missing term in the science of form. *Paleobiology*, 8(1), 4–15.
- Heyes, C. 2018. *Cognitive gadgets: The cultural evolution of thinking*. Cambridge, MA: Harvard University Press.
- Houston, S. D. (2004). *The first writing: Script invention as history and process*. New York, NY: Cambridge University Press.
- Kalish, M., Griffiths, T. & Lewandowsky, S. (2007). Iterated learning: Intergenerational knowledge transmission reveals inductive biases. *Psychonomic Bulletin & Review*, 14(2), 288–294.
- Karmiloff-Smith, A. (1995). *Beyond Modularity—A developmental perspective on cognitive science* (New ed.). Cambridge, MA: MIT Press.
- Morin, O. (2016a). *How traditions live and die*. Cambridge MA: Oxford University Press.
- Morin, O. (2016b). Reasons to be fussy about cultural evolution. *Biology and Philosophy*, 31(3), 447–458.
- Prinz, J. J. (2013). *Beyond human nature: How culture and experience shape our lives*. London, England: Penguin.
- Richerson, P., Baldini, R., Bell, A. V., Demps, K., Frost, K., Hillis, V., ... Zefferman, M. (2016). Cultural group selection plays an essential role in explaining human cooperation: A sketch of the evidence. *The Behavioral and Brain Sciences*, 39, e30.
- Richerson, P. & Boyd, R. (2005). *Not by genes alone*. Chicago, IL: The University of Chicago Press.
- Southgate, V., Senju, A. & Csibra, G. (2007). Action anticipation through attribution of false belief by 2-year-olds. *Psychological Science*, 18(7), 587–592.
- Sperber, D. (2005). Modularity and relevance: How can a massively modular mind be flexible and context-sensitive? In L. Stephen, P. Carruthers & S. Stich (Eds.), *The Innate mind: Structure and content* (pp. 53–69). New York, NY: Oxford University Press.
- Sterelny, K. (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, 42–50.
- Strimling, P., Enquist, M. & Eriksson, K. (2009). Repeated learning makes cultural evolution unique. *National Academy of Sciences*, 106(33), 13870–13874.
- Zawidzki, T. (2013). *Mindshaping: A new framework for understanding human social cognition*. Cambridge, MA: MIT Press.

How to cite this article: Morin O. Did social cognition evolve by cultural group selection? *Mind Lang.* 2019;1–10. <https://doi.org/10.1111/mila.12252>