**Coordination in Social Learning: Expanding the Narrative on the Evolution of Social Norms**

*This is a preprint of a paper that’s been accepted at the European Journal for Philosophy of Science. Please cite the official version once it’s available.* Feel free to contact me with any questions at [basil.mueller@unibe.ch](mailto:basil.mueller@unibe.ch).

**Abstract**

A shared narrative in the literature on the evolution of cooperation maintains that social *learning* evolves early to allow for the transmission of cumulative culture. Social *norms*, whilst present at the outset, only rise to prominence later on, mainly to stabilise cooperation against the threat of defection.

In contrast, I argue that once we consider insights from social epistemology, an expansion of this narrative presents itself: An interesting kind of social norm — an epistemic coordination norm — was operative in early and important instances of specialised social learning. I show how there’s a need for such norms in two key social learning strategies and explain how this need is constituted. In assessor-teaching (e.g. Castro et al. 2019; 2021), epistemic coordination norms allow agents to coordinate around the *content* of social learning, i.e., what is to be known and how this is to be done. These norms also allow agents to coordinate around the form of cultural learning in what’s sometimes called strategic social learning (Laland 2004; Hoppitt and Laland 2013; Heyes 2018, chap. 5) and elsewhere. Broadly speaking, this concerns how cultural learning is organised within the social group. The upshot is that the evolution of social learning and social norms are intertwined in important and underappreciated ways from early on.

The above matters as it informs our views about the evolution of social norms more generally. Truly *social* norms emerged to coordinate a plurality of complex behaviours and interactions, amongst them specialised social learning. I substantiate this view by contrasting it with Jonathan Birch’s views on the evolution of norms. What results is a general but cohesive narrative on the early evolution of social norms.

**Keywords**: *Social Norms, Cooperation, Social Learning, Epistemic Norms, Normative Cognition, Coordination*

**Declarations**

**Funding:** Swiss National Science Foundation, Grant Number: PCEFP1\_186936

**Conflicts of interest/Competing Interests:** None

**Acknowledgements:** I’d like to thank Rebekka Hufendiek, Ivan Gonzalez-Cabrera, and Christine Sievers for their helpful feedback and general support in writing this paper. Additional thanks to the audiences and organisers of the Workshop associated with Kim Sterelny’s Carnap Lectures at the Ruhr-University of Bochum for their insightful comments and questions.

1. **Introduction**

In the literature on the evolution of cooperation, a shared narrative connects social learning and social norms. In a nutshell, the idea is this: Specialised social *learning* emerges early to allow for the transmission of cumulative culture. In turn, cumulative culture and different kinds of cooperation interact favourably with each other, becoming more and more central to our ancestors’ way of life. Social norms, in turn, only become truly important later on — once cumulative culture and cooperation are established to a considerable degree and mainly to regulate large-scale collaboration against the threat of defection (see, e.g., Sterelny 2021b; Tomasello 2014; Henrich 2015).

The main contribution of this paper (sections 2 and 3) is to expand on this narrative. The novel claim I make is that the ways in which we share and acquire knowledge are and — as I’ll argue — *have been* deeply normative. Social learning’s evolution is not as neatly separated from social norms as the above narrative suggests but intertwined with it in important ways. In particular, the advent of cumulative culture gave rise to coordination problems in social learning that were solved by employing social norms. To make this point, I’m drawing from social epistemological theorising on *epistemic* social norms (see, e.g., Faulkner 2011; Goldberg 2018; Graham 2015; Greco 2020; Henderson 2020; Henderson and Graham 2017; Simion 2021). These norms guide agents in acquiring practical and propositional knowledge in social learning and elsewhere.

I suggest that a sub-kind of such a norm — an epistemic coordination-norm (Henderson 2020) — functioned to regulate both what I call the *content* and the *form* of cultural learning. I show how there’s a need for such norms in two key social learning strategies and explain how this need is constituted. In assessor-teaching (e.g. Castro et al. 2019; 2021), epistemic coordination norms allow agents to coordinate around the *content* of social learning, i.e., what is to be known and how this is to be done. These norms also allow agents to coordinate around the *form* of cultural learning in what’s sometimes called strategic social learning (Laland 2004; Hoppitt and Laland 2013; Heyes 2018, chap. 5) and elsewhere. Broadly speaking, this concerns how cultural learning is organised within the social group, i.e. under which conditions agents learn from others, from whom they learn, which strategies or mechanisms they’re incentivised to employ and how their learning environments are structured.

Whereas the existing literature on the evolution of epistemic norms has mainly focused on the exchange of reasons (Tomasello 2020; Norman 2016; Mercier and Sperber 2017), the upshot of this section is that social learning has been a normative phenomenon for longer than we might have thought. What emerges is thus a new view on the evolution of cumulative culture and social learning.

In the second part of the paper (section 4), I show why the above view matters, as it has implications not only for our understanding of cumulative culture but also for how we think about the evolution of social norms. I suggest that truly *social* norms emerged to coordinate a plurality of complex behaviours and interactions. To substantiate this picture, I discuss one of the most prominent accounts of the evolutionary emergence of social norms — Jonathan Birch’s (2021a). I point out how assumptions about the nature of (social) norms lead to different views on their evolution: Birch makes use of a more general concept, where a norm is just any standard of correctness, but thereby doesn’t discriminate clearly between a crucial evolutionary transition — a transition from norms that only serve to guide an individual’s behaviour in light of their own private goals to truly social norms. I also offer a more pluralistic take on what might have brought this transition about. Whereas Birch implies that this was due to problems related to toolmaking, I’ll argue that cumulative culture brought with it a variety of coordination problems, amongst them those related to toolmaking, social learning, and the exchange of reasons. It’s because of the combination and interplay of these different selection pressures that social norms emerged. The upshot of this section is a general but cohesive narrative on the evolution of social norms.

Much of this paper is, of course, speculative to some degree. However, as I’ll show, there is some preliminary support, and the view has the potential to unify different accounts of the evolution of social norms and has interesting implications for debates around animal normativity (see the conclusion). Overall, the paper provides an alternative view on the evolution of cultural learning and social norms — a view that hopefully inspires and will be substantiated by further research.

1. **The Evolution of Social Learning and Social Epistemic Norms**
   1. Stage setting

Before we get into the evolution of social learning and social norms, let me briefly introduce some of the notions we’ll be working with.

Social learning is learning that is assisted by observation of or interaction with other agents or the outputs of their behaviours (Heyes 2021; Hoppitt and Laland 2013). Nowadays, it’s uncontroversial that many non-human animals learn this way (Heyes 2021 section 3 for an overview). Here, I focus on an important subset of this sort of social learning — what’s sometimes called cultural learning. Cultural learning describes mechanisms and strategies adapted (culturally or genetically) to share and acquire cultural traits with/from others effectively. One might think of these as mechanisms specialised to learn from others socially. While I remain agnostic on this question, some believe these mechanisms are specific to humans. Cultural learning consists of various mechanisms and strategies. For example, such cultural learning is often said to include imitation: Humans imitate others' behaviour — even to an irrational degree (Henrich 2015; Nagell, Olguin, and Tomasello 1993) — to acquire cultural information from them. Cultural traits are also considered causally opaque, which is why explicit teaching is seen as another key mechanism (e.g., Csibra and Gergely 2011; 2009). In the following, I’ll use the terms “cultural learning” and “specialised social learning” interchangeably.

Cultural learning is so important to humans because we need to acquire a lot of social or cultural information and knowledge. We humans are a cultural species and depend on cultural practices, knowledge, and techniques for our survival (see, e.g., Sterelny 2012). One key notion here is “cumulative culture”: Cultural achievements — technologies, social practices, and knowledge — are being refined by each generation. Culture is cumulative in the sense that the refinements of past generations are additive: Modifications of cultural knowledge or techniques add up to cumulative culture (Henrich 2015; Mesoudi and Thornton 2018; Sterelny 2021, chap. 1).

We can use Tennie et al.’s (2009; Bandini et al. 2021) notion of a ‘zone of latent solutions’ [ZLS] to characterise cumulative culture further. An ability or a belief is part of an individual’s ZLS if it could be acquired by individual learning. The kind of knowledge humans need to acquire quickly exceeds their ZLS. This might be because the behaviour in question is too complex for agents to grasp for themselves, because of time or resource constraints, or because the outcomes of the behaviour are causally opaque or ambiguous — i.e., it’s unclear whether and why the behaviour was successful — because trial-and-error learning is costly or because environments are fast-changing (see, e.g., Sterelny 2021b, chaps 1 & 2). Put differently, it’s because of the importance of cumulative culture for our way of life and the fact that we can’t attain it on our own that we depend so heavily on cultural learning (Sterelny 2021b; Henrich 2015; Tennie, Call, and Tomasello 2009).

Turning to social norms, as I’ll use the term here, “social norm” is a general term for a variety of socially normative phenomena, such as conventions or what’s sometimes called social norms in the strict sense (Bicchieri 2005). In general, social norms are rules that guide agents in which behaviours are appropriate, permissible, or obligatory in specific situations and communities — in other words, they set standards of correctness for behaviours in specific contexts.

More specifically, the notion of “social norm” used here is inspired by game-theoretic accounts, where social norms are seen to solve collective action problems (Young 1998; Gintis 2014; Lewis 1969). This approach has been hugely influential, both in philosophical (see e.g. Bicchieri 2005) and evolutionary (see e.g. Henrich and Muthukrishna 2021; Richerson and Boyd 2008; Sterelny 2021b) literature. On this view, social norms regulate collective action so that public goods and/or shared goals can be attained. On my understanding, this characterisation of social norms is functional in nature: It describes what social norms do — they have the function of regulating complex social interactions (broadly understood), including collective action. As we’ll see below, this view allows us to individuate different kinds of social norms based on their role in solving different types of collective action problems. Outside of this functional commitment, the view is compatible with different accounts of what social norms are (e.g. Bicchieri 2005; Brennan et al. 2013; van Wietmarschen 2021) and what kind of norm psychology is required to engage with them (e.g., Sripada and Stich 2006; Heyes 2022; Westra and Andrews 2021b).[[1]](#footnote-1), [[2]](#footnote-2)

* 1. A shared narrative

Let’s turn to the aforementioned shared narrative on the evolution of social norms and social learning that we find in the literature on the evolution of cooperation.

I subscribe to a broadly Sterelnian view of the evolution of social learning, according to which, at the outset, our ancestors didn’t acquire information, beliefs, and knowledge by means of specialised social learning mechanisms (Sterelny 2021b, chap. 1; 2012). Instead, early humans acquired knowledge through being good individual learners and hybrid-learning strategies, where juveniles acquired cultural information in scaffolded learning environments, mostly via trial-and-error learning.

Specialised social learning mechanisms emerged over time because of the increased informational demands of various cooperative endeavours, though foraging is considered key (Tomasello et al. 2012). In general, human cooperation established itself via a set of positive feedback loops, relating different forms of cooperation. Next to reproductive cooperation, ecological (mainly foraging) and informational cooperation (i.e., social learning) mutually benefit from each other. Consider how many kinds of cooperation are informationally very demanding, e.g., successful foraging requires individuals to be well-informed, have expertise, and master specific techniques. In turn, it is thought that the spoils of successful cooperation make extensive acquisition and sharing of information, expertise, and techniques possible, partly by prolonging agents’ life histories and partly by allowing for the development and transmission of cumulative culture (Sterelny 2012).

Another way to put this is that cultural learning is required for (cumulative) culture. In turn, cumulative culture interacts favourably with different kinds of cooperation as these depend on cultural information.

The kind of social norm that’s mostly under discussion in this narrative emerges, at least in part, to stabilise cooperation, often against the threat of defection, cheating, or free-riding. Because, in the absence of social norms, agents are incentivised to defect, they’ll be inclined to not behave in the required ways for cooperation to work out (Fehr, Fischbacher, and Gächter 2002; Gintis et al. 2008).[[3]](#footnote-3) This kind of social norm changes the payoff structure of these interactions such that it's more advantageous for individuals to behave in the ways required of them. The relevant mechanisms here are usually seen to be sanctioning, reputation, and internalisation (Henrich and Muthukrishna 2021; Westra and Andrews 2021b; Bicchieri 2005; Sterelny 2021b). To avoid confusion, I will call these norms [cooperation-norms] since they are seen to stabilise cooperation, mainly against the threat of defection.

Most accounts maintain that the emergence of cooperation-norms is due to coevolutionary processes driven by the kinds of feedback loops that connect different kinds of cooperation described above. These accounts will maintain that cooperation-norms were already present — even if only to a very minor degree, as we’ll see below — at the outset, when cultural learning emerged. Then, as these coevolutionary processes accelerate and as culture (and various kinds of cooperation it’s based on) become more and more central to our way of life, cooperation-norms become increasingly prominent, explicit, and institutionalised. This is mostly seen to be driven by an increase in group size, between-group competition, or indirect reciprocation (e.g. Richerson and Boyd 2008; Tomasello 2014; Sterelny 2021b). Because of these factors, agents start to become more (or more frequently) incentivised to cheat or free-ride on others’ efforts, and it’s because of this that there’s a need for cooperation-norms. This is why these theories posit a gradual change in the importance and prominence of cooperation-norms: At the beginning of human cooperation, they were comparatively unimportant but rose to prominence later on.

What I’d like to highlight here is that — although they are assumed to have been present in some form — cooperation-norms (and thereby social norms more generally) weren’t thought to play a very prominent role in the early evolution of cultural learning. So, the shared narrative we find in this literature suggests that cooperation, in general, and cultural learning, in particular, mostly functioned without the aid of social norms. For example, Sterelny (and others) also take it that — at least at the outset — cultural learning and informational cooperation more generally, were stable without the assistance of cooperation-norms. This is due to the relative absence of incentives to defect from informational forms of cooperation (see Sterelny 2012, 132–38).

Additionally, several passages of key papers in the literature favour such an understanding of our shared narrative. Consider, for example, Muthukrishna’s and Henrich’s (2021, 212) discussion of social norms stabilising cooperation in this way *after* social learning has been established:

“*once* individuals possessed sufficiently sophisticated cognitive abilities to reliably culturally learn […] stable patterns of costly behavior will emerge and can be sustained for long periods within a community. These patterns are social norms because anyone who deviates […] will be sanctioned.”

Relatedly, although Sterelny is sceptical of the group-selection framework that Henrich (and others) favour, he too locates the emergence of *social* norms in the late Pleistocene and views them as stabilising cooperation:

“The take-home message of this chapter is that culturally evolved tools—language, myth, ritual, *explicit norms*—play a central role in the stability of cooperation in the late Pleistocene shift in the economic foundations of cooperation” (2021b, 56)

“By reducing ambiguity, norms of sharing and division make defecting more overt, less deniable. But it is one thing to detect cheating, another to respond to it. [… ]it is likely that internalizing norms, and the outrage that flagrant violations then provoke, are essential in mobilizing third party support to sanction cheating.” (2021b, 82)

What emerges is a shared narrative as part of which social norms, particularly cooperation-norms, played a minor role in the early evolution of cultural learning and only rose to prominence over time.

1. **The evolution of social learning and epistemic coordination norms**

I take it that this narrative, as it stands, is largely plausible. So, what follows is an expansion of, rather than an objection to, our shared narrative on the evolution of cultural learning and social norms. As we’ll see, this has interesting implications for the literature on the evolution of social norms more generally.

In particular, when it comes to the involvement of social norms in the evolution of cultural learning, I’d like to argue for a more differentiated view. Whilst it is plausible that the relative stability of social learning interactions did lead to cooperation-norms being less important at the outset, the novel claim that I’d like to argue for here is that another kind of social norm — what I will call an epistemic coordination-norm — was operative in early instances of specialised social learning. Drawing from work in social epistemology, I’ll show how successful cultural learning requires coordination on a range of epistemic parameters and how social norms provide this kind of coordination. It will turn out that social learning, especially of the specialised sort, has been a normative phenomenon for longer than we have thought.

* 1. Social Epistemic Norms and Epistemic Coordination-Norms

Let me first say a few things about coordination-norms: Being a kind of social norm, coordination-norms also emerge in collective action contexts, where interdependent social groups seek to acquire public goods or promote collective aims (Bicchieri 2005). As the name already implies, coordination-norms help coordinate complex behaviours with multiple agents involved, often in contexts of division of labour and expertise. To attain these goods/goals, individuals need to behave in specific (and often differing) ways. In many instances, however, there are multiple ways in which the good in question could be attained, multiple ways in which single individuals could try to behave to attain the good. For instance, agents might need to coordinate the division of labour and set common, even if context-relative, standards for the behaviours in question. Coordination-norms specify each individual's contribution and provide standards for the respective behaviors so that the good can be attained.[[4]](#footnote-4)

Coordination-norms contrast with cooperation-norms in terms of function: Whereas the latter mainly function to disincentivise agents from defecting from cooperation, for coordination-norms, it’s assumed that agents are already incentivised to behave in ways so that the goal is attained. The problem that coordination-norms solve isn’t one of incentives to cooperate but rather one of how agents should go about doing so. Coordination-norms thus function to prevent coordination-failures.

The coordination-norms operative in early instances of cultural learning were *epistemic* coordination-norms (Henderson 2020).[[5]](#footnote-5) To see this, consider that social learning is an epistemic activity: In cultural learning, information and knowledge (both practical and propositional, and mostly of the cumulative cultural kind) are transmitted from at least one agent to another (Levy and Alfano 2020). Social epistemologists, though they have mostly focused on testimony, have in recent years begun to consider how social epistemic norms regulate how knowledge is being transmitted between agents (see e.g. Abbate 2021; Faulkner 2011; Goldberg 2018; Graham 2015; Greco 2020; Henderson 2020; Henderson and Graham 2017). These kinds of norms are also operative in social learning. Such social epistemic norms guide agents in how they should engage with and share information. As with other social norms, social epistemic norms are in place to promote the acquisition of public goods or shared aims in interdependent social groups. For social epistemic norms, the good in question is both practical and propositional knowledge, and the aims in question have to do with their acquisition and transmission.

Social epistemic norms thus conceived include the kinds of norms that social epistemologists mainly focus on — norms that tell us how to form, revise, maintain or suspend our beliefs and how to share them to gain propositional knowledge (see e.g. Abbate 2021; Faulkner 2011; Goldberg 2018; Graham 2015; Greco 2020; Henderson 2020; Henderson and Graham 2017). However, they also include norms that guide agents in acquiring *practical* knowledge. This is important because social learning isn’t just used to transmit propositional knowledge but also skills, abilities, and techniques — typical examples of practical knowledge. So, the kinds of norms that I’ll argue structure social learning are broader in scope than what social epistemologists focus on. Seeing as these norms guide agents in acquiring and sharing knowledge — be it of the practical or propositional kind — it nonetheless seems apt to call them social epistemic norms.[[6]](#footnote-6)

We can turn to work in social epistemology to see how various epistemic activities require coordination. To see this, consider these parallels in work on the evolution of cooperation and social epistemology: Just as it’s long been maintained in the evolutionary literature that social groups are practically interdependent — they depend on others for the success of their (often collective) actions (Tomasello et al. 2012) — it’s become standard in present-day social epistemology to consider social groups as epistemically interdependent (Hardwig 1985; Greco forthcoming) and as displaying division of epistemic labour (e.g. Goldberg 2011). Social groups divide epistemic labour (who knows about or understands p; who comes to find out that p), and agents within these groups depend on each other for this sort of labour. I might ask my football expert friend about who the best English midfielder in the mid-2000s was, and I may depend on their expertise in forming my beliefs. Relatedly, research groups and collaborations divide epistemic labour within or between them and will depend on each other to make progress on their research question (see, e.g., de Ridder 2014).

Epistemic communities that display such division of epistemic labour must coordinate on various epistemic parameters. For example, they’ll plausibly require different evidential standards for belief. These standards will often be context-sensitive and change over time, so hard-wired and inflexible solutions will not do. Presumably, seeing as there are different stakes attached, believing that p in scientific contexts requires more evidence than believing that p when it comes to who was England’s best midfielder in the mid-2000s. Relatedly, agents might need to coordinate on which reasoning style they employ or which source they deem trustworthy (see, e.g., Dogramaci 2015; Carr 2022) for collective inquiry to be successful. If agent A employs a reasoning style F and defers to source Y, but agent B employs a reasoning style G and defers to source X, A and B might not successfully collaborate, as they won’t come to understand the others’ reasoning and distrust the other’s sources. Thus, there’s a need to coordinate around reasoning styles, evidential thresholds and other epistemic parameters in various epistemic contexts (see Henderson and Graham 2017; Henderson 2020 for more).

* 1. Epistemic Coordination-Norms in Cultural Learning

I’d like to make plausible the idea that just as there’s a need to coordinate on various epistemic parameters presently addressed by epistemic coordination-norms, the same was the case for the early emergence of cultural learning. Before I go into more detail below, here’s the general picture: Cultural learning is a complex collective epistemic undertaking. Not only are learning contents extensive and complex, but learners also acquire cultural traits (knowledge, abilities, techniques) from several models over a large span of time. Additionally, whom learners are supposed to learn from and when they should do so is subject to contextual factors and potentially fast-changing. These and other factors make cultural learning vulnerable to coordination failures. For example, agents might acquire the wrong cultural knowledge and abilities for their particular context or learn from the wrong models at inopportune times. This shows that the members of social groups will need to coordinate on the contents and the form of cultural learning — what agents learn about and, roughly speaking, how they’re supposed to do this — for cultural learning to succeed.[[7]](#footnote-7) Epistemic coordination-norms function to regulate these complex learning interactions by providing standards regarding both the content and form of cultural learning.

By way of a toy example, let’s imagine an early ancestor A of ours. A’s a juvenile looking to acquire the required knowledge and abilities in their respective environment. A won’t know which cultural traits they need to acquire by themselves, as these are outside of their ZLS. A’s cultural learning efforts will be directed by those around them — they might guide A to acquire the skills and knowledge required to make a particular tool. Additionally, those around A would guide them to learn from those whose in-group status is related to their proficiency in toolmaking and guide agents towards who that might be. They’d also guide them to figure things out for themselves at certain junctions of the process and defer to others at other times. The suggestion here is that what A was instructed to learn about and how they were to do so was informed by the epistemic coordination-norms of A’s community.

It's worth highlighting that epistemic coordination-norms in particular and social norms more generally are the right kind of solution to the coordination problems posed by cultural learning, as they’re both specific and flexible. They’re specific in being sensitive to fine-grained differences in contexts — even small changes in context will change whether and which social norm is operative. They’re flexible in that they can quickly adapt to changes in context or social dynamics — what is required of agents can change over a relatively short amount of time. These two properties of social norms are important as what learning contents agents need to acquire and what form cultural learning is supposed to take, was and is subject to contextual factors and is potentially fast-changing.

I’ll expand on these points below by drawing from work in social epistemology and by discussing two important kinds of cultural learning: assessor-teaching and strategic social learning. I highlight how the need for coordination is constituted within these strategies and how epistemic coordination-norms have plausibly addressed it. Both are considered essential to the evolutionary emergence of cumulative culture and social learning more generally. Showing how there’s a need for coordination norms within these strategies thus supports the expansion of our shared narrative along the lines I propose.

Let me again mention that the expansion I propose fits well with an idea central to our shared narrative: That informational cooperation was, at the outset, stable without cooperation-norms and thus low on incentives to defect (Sterelny 2012; Tomasello 2014). However, despite this stability, there was a need for coordination that was addressed by epistemic coordination norms.

As we’ll see in section 4, the view I propose also fits well with the generally accepted narrative since it provides an evolutionary precursor to cooperation-norms (and the respective normative cognition) in the form of coordination-norms. This allows us to see how existing resources were transformed because of increased incentives to defect (likely in combination with other factors). Social norms changed from being coordination-norms to (also) being cooperation-norms.

* 1. Assessor-teaching and epistemic coordination norms

Castro et al. (2021, 7) propose that assessor-teaching, “the ability to orient the learning of offspring using signs of approval/disapproval”, was important to the evolution of cultural learning by making it more high-fidelity, thus allowing for cumulative culture (see also Castro, Castro-Nogueira, and Toro 2019; Castro et al. 2019). The authors consider how such assessor-teaching “allows parents to transmit to children their accumulated experience” (Castro et al. 2021, 7) about the behaviour that is being learned.[[8]](#footnote-8), [[9]](#footnote-9) It's easy to see how parents’ evaluations of their offspring’s behaviours imply the existence of a norm of some kind. Consider that their evaluations need to stand in relation to some standard of correctness. Evaluating others’ behaviour implies that there’s a way to tell whether the behaviour is good or bad, to be commended or sanctioned. In turn, this requires a standard against which behaviours can be measured — or, in other words, it requires a norm.

Now, it’s important to note that this norm does not necessarily need to be a *social* norm in an interesting sense. It’s certainly imaginable that the norm parents apply to their offspring’s behaviour doesn’t function to regulate collective action or complex social interactions. Parents might, for example, have established that norm simply based on their own private experiences over their lifetime. There would thus be a sense in which the norm would be personal. I’ll have more to say on the role of such personal norms in the evolution of norms in section 4. Here, I’d like to argue that the norms operative in early instances of assessor-teaching were indeed social in an interesting sense — they were epistemic coordination-norms.

The reason for this is that relying solely on one’s own personal experience will often not be sufficient to bring about positive learning outcomes. The general point is that the behaviours and knowledge to be acquired must be coordinated with the behaviours and related knowledge that others acquire. In interdependent social groups, there needs to be a fit between the knowledge and abilities of different agents for collective action to work out. Social groups thus need to coordinate on various epistemic parameters for collective epistemic undertakings, such as cultural learning, to be successful.

More concretely, epistemic norms help to alleviate the following *content-related* coordination problems:

First, they help to coordinate around what is to be known or what one might call a community’s *range of relevance* (Sertler 2022).[[10]](#footnote-10) Simply put, a community’s range of relevance describes what is worthy of our attention, what is important to know about, which abilities are truly beneficial, and what we can safely ignore. They reflect a community’s priorities and commitments regarding how they understand and interact with the world and thereby influence what we do and do not pay attention to (Grasswick 2004, 104). So, concerning assessor-teaching, parents need to guide their children not just to what’s important to them (the parents) but also to what’s important for them (the children) to know in order to flourish within their particular or future community. Epistemic norms set a standard for what lies within a community’s range of relevance and outside of it, thereby allowing parents to evaluate their offspring’s activities with this in mind. Parents might, for example, need to instruct their children regarding which parts of their surroundings they should learn about — how prey can be located in a specific environment — and which parts can be ignored.

Relatedly, such norms also set ranges of relevance for what particular individuals-in-communities (Grasswick 2004) are supposed to know. This becomes especially pertinent in cases of division of labour, where members of the same social group need to learn different things. Consider, for example, how the production of complex tools (which require division of labour) makes it essential for parents (or other teachers) to teach learners in ways that enable them to acquire the skills relevant to one step in the tool-production process but ignore others.

Epistemic coordination-norms thus specify the content of cultural learning. They specify what all agents need to know (e.g., how prey can be located, how their group hunts), what all can safely ignore, and what specific individuals need to know (e.g., a particular step in the toolmaking process) or can ignore.

Second, once social groups have coordinated around *what* learners need to know, there is additionally a need to coordinate how learners might do these things correctly. For example, on Jonathan Birch’s (2021a) account of the evolution of norms, hominins needed to coordinate on the standards of toolmaking. They needed to coordinate on what would count as a good tool in a given context and how such tools could be produced. Hence, cultural learning — e.g., parents’ evaluations of their offspring’s attempts in toolmaking — needs to stand in relation to such norms to be successful. Parents’ evaluations of their offspring's toolmaking attempts must be guided by the norms regulating what counts as a good tool in a given context.

Interestingly, there’s evidence in favour of increased standardisation in toolmaking in the Acheulean (García-Medrano et al. 2022). Importantly, standardisation is often specific to certain sites, and quantitative, i.e. tools at particular sites are more often than not made in a particular fashion. I take it that this can be read to support my view, as coordination-norms are context-specific: Different sites might have coordinated differently on what counts as a good tool and how that tool is supposed to be produced. In the beginning, these norms might have been rather vague, thus allowing for differences in toolmaking, but have increased in specificity over time, hence the increase in standardisation. These norms might also have allowed for multiple ways of creating these tools as long as they ultimately possessed certain features.[[11]](#footnote-11)

I’ll discuss Birch’s account in more detail in section 4. For now, it’s important to point out that agents likely also needed to coordinate on how they might correctly employ some of their *epistemic* capacities (Sertler 2022; Dotson 2017 sct. 4.1 & 4.3). Or, put differently, there’s a need to coordinate the kinds of epistemic (Grasswick 2004) or hermeneutical (Fricker 2007) resources that we employ (and would like to cultivate in others). As Grasswick describes, “we grow up in communities and learn our epistemic skills within communities” (2004: 100). How we, e.g., reason and exchange reasons is shaped by the social practices of our communities. The idea is that agents culturally acquired their epistemic skills just as with toolmaking. And just like toolmaking, epistemic skills, too, are subject to epistemic coordination norms. So, the cultural acquisition of epistemic skills also needs to stand in relation to the norms guiding epistemic skills. I’ll expand on this point by drawing from the literature on the evolution of reasoning, but of course, other capacities might also be relevant.

There is a growing consensus that, evolutionarily speaking, reasoning is not an individual but rather a social affair. Reasons are not produced by and for the very same individual to arrive at better decisions and attain knowledge. Instead, reasons are exchanged with others to convince them, justify oneself, evaluate others’ reasons and reasoning, or align the intentions of members of a social group. Call this the social view of reasoning since it focuses on the social exchange of reasons (Dutilh Novaes 2018; 2020; Mercier and Sperber 2011; 2017; Norman 2016; Seitz 2020; Sterelny 2018; Tomasello 2014; 2020).

We can see that the exchange of reason gives rise to a coordination problem: Briefly put, agents need to coordinate around what makes a reason better than another, sufficient for justification, or relevant to evaluating someone’s behaviour so that they can benefit from exchanging reasons. Social epistemic norms solve this problem by providing standards for what constitutes good reasons (Tomasello 2014; Mercier and Sperber 2017). It’s important to note that such reason exchanges do not require language but can also occur via gestures, pointing, and other proto-language forms of communication (Tomasello 2014; Norman 2016).[[12]](#footnote-12)

Consider, for example, how the reading of tracks — which is essential to persistence hunting, likely one the oldest hunting strategies employed by our ancestors (Bramble and Lieberman 2004) — required that agents could agree on how tracks were to be read and/or who’s reading of the tracks one was supposed to trust. Or consider how Naskapi hunters use a charred/burned shoulder blade of a caribou as a map of sorts to decide where they ought to hunt (Henrich 2015). Presumably, agents might have disagreed on either of these things: There were likely different but sensible ways of reading tracks and deciding where to hunt in particular contexts, and so agents would have exchanged proto-reasons on how to do so. The need to coordinate on how to read tracks or where to hunt gives rise to a need to coordinate on the reasons for doing so. Epistemic coordination norms addressed this need, and it’s in relation to these kinds of norms that parents then evaluated their children’s behaviour in assessor-teaching.

In summary, epistemic coordination-norms regulate cultural learning by specifying relevant learning contents — the communities’ respective range of relevance — and by setting standards of adequate performance for epistemic and non-epistemic abilities and techniques.

* 1. The form of cultural learning and epistemic coordination-norms

Our ancestors didn’t only need to coordinate on the *content* of cultural learning — what agents should learn and how to employ the learned capacities correctly — they also needed to coordinate on its *form* — how cultural learning is organised within the social group, i.e., under which conditions agents learn from others, from whom they learn from, which strategies or mechanisms they’re incentivised to employ, and how their learning environments are structured.

This is the general view I’d like to argue for here: What form cultural learning takes in social groups is subject to various contingent contextual factors. Because of this, figuring out what form cultural learning is supposed to take in any particular case is beyond the capacities of individual agents. Additionally, there’s a need for the form of cultural learning to be coordinated within groups. As a result, epistemic coordination norms regulate cultural learning’s form.

Before developing this further, let me briefly note that extant literature on what’s often called selective, strategic, or biased social learning does discuss the idea that the form of cultural learning, especially whom agents learn from and when, is being regulated by social norms. Social learning is biased or strategic if “the influence of other agents varies with the circumstances of the encounter (“when-selectivity”) or with some feature of the available models (“who-selectivity”).” (Heyes 2018, 91). In other words, agents are sensitive to questions of whom they should learn from and when they should do so. The two main approaches to selective social learning in the literature — what’s sometimes called strategic and attentional approaches (Heyes 2018; Henrich 2015)[[13]](#footnote-13) — agree that this kind of learning is aided or regulated by norms, which I would say are epistemic coordination norms. These norms might, for example, instruct agents to learn from others when they’re sufficiently uncertain (maybe because of a change in environmental conditions) (Laland 2004), that they should learn from others if the information-donor intends to help them (Heyes 2018, 107), or that they should learn from prestigious individuals (Henrich and Gil-White 2001). These norms might also guide agents to be more curious and playful to encourage innovation (Riede et al. 2018) or encourage individual refinement of traits after they’ve been socially acquired (Ehn and Laland 2012).

Whilst this lends some support to the view I advocate, perhaps a for purpose more revealing question is *why* the form of cultural learning, including whom agents learn from and when, is subject to such norms.

As a starting point, consider that, per definition, cumulative cultural knowledge and abilities are such that an individual cannot acquire them by themselves but must depend on others to do so. But it’s long been acknowledged that simply learning from anybody at each instance is not a beneficial strategy (Laland 2004). The reason for this is simple: There’s a vicious circularity to everyone solely learning from others. Not only does culture stagnate, but what’s being learned from others will likely be decoupled from what’s going on in their environment — and thus not adapted to it — since no new information is coming into the group via individual learning (Boyd and Richerson 1988). Social groups need to strike a delicate balance regarding the trade-off of acquiring new information via individual learning and innovation and allowing agents to gain access to cultural knowledge and abilities via cultural learning (Kandler and Laland 2009).

Insights from social epistemology further complicate this trade-off: Several scholars have recognised that an over-reliance on one’s own reasoning capacities leads to false beliefs in many contexts; this is chiefly due to the scope and complexity of the information that agents would need to have access to (see, e.g., Grundmann 2021; Buzzell and Rini 2022; Levy 2022). Doing your own research — these people think — is often a bad idea. At the same time, however, acquiring knowledge via individual learning could be conducive to building up the relevant epistemic capacities in the long term — even if it is unproductive in the short term. Others argue that individual learning might not be conducive to acquiring knowledge, but it might be useful to acquire other epistemic goods, such as understanding (Levy 2022; Matheson 2022). The idea being that simply deferring to what others assert isn’t sufficient to come to understand for oneself: If I defer to my football expert friend with regards to who the best English midfielder of the mid-2000s was — without thinking things through on my own — I won’t thereby come to understand why this is so. In turn, I might be unable to apply these insights where it matters: I might be unable to come up with a good answer for who the best English *striker* of the mid-2000s was. So, depending on the kind of epistemic good that needs to be acquired — understanding or mere knowledge — a different kind of learning strategy is required.

The picture that emerges here is that the form of cultural learning — under which conditions agents learn from others, from whom they learn, which strategies or mechanisms they’re incentivised to employ and how their learning environments are structured — is subject to a host of contextual factors. Not only does it depend on balancing innovation vs. information-transmission and depends on the epistemic good that is to be acquired, but what form cultural learning takes is also impacted by factors such as group size: Larger groups can more easily allow for specialisation and the kind of innovation that comes with it (Ofek 2004). Notably, the size and connectedness of a group (both internally and between groups) is known to have changed depending on seasons and other external factors. Similarly, a group’s dominance structure impacts inventiveness; for example, particularly dominant structures have hampering effects on innovation and also change seasonally (see, e.g., Sterelny 2021b, chap. 1; Hill et al. 2011; Pradhan, Tennie, and van Schaik 2012). Relatedly, social groups that are economically well-off — say because they live in a friendly habitat during a season with food surplus — can more readily allow for experimentation. This balance is also contextual in that it’s specific to i) cultural traits: It will likely look different for trait1 than for cultural trait2, depending, e.g., on the trait’s complexity or the dangers that come with its acquisition (think those inherent to big game hunting). Additionally, unpredictable pay-offs of modification lead to stronger conformity in transmitting cultural traits (Caldwell and Millen 2010). Such uncertainty can be specific to traits. The trade-off is also contextual in being specific to the type of learner and model/teacher: Inexperienced learners have different needs and capacities than more seasoned ones, and different types of teachers might be more suitable to different kinds of learners and/or might more efficiently invest their resources elsewhere.

Why does it matter that the form of cultural learning is subject to these contextual factors and that there is this balance that social groups need to strike? It matters because, as described in section 3.2, contingent contextual factors give rise to coordination failures: Cultural learning won’t be successful if social groups don’t coordinate how information is transmitted. These contextual factors are obstacles to such coordination. Because of these factors, how groups are supposed to coordinate cultural learning will vary considerably. It’s hard to choose the right cultural learning strategy, i.e., the one that allows information to pass between members of your group, if this is subject to factors that vary between contexts and are hard to ascertain for individual agents. For example, for every learning episode, agents must evaluate what kind of learner is to acquire which kind of skill and under what kind of conditions in which kinds of environments. Pre-coordination this is challenging to estimate correctly — which is why cultural learning is regulated by epistemic coordination-norms. They’re the right solutions to these kinds of problems, as they’re both flexible and specific enough to accommodate them.

In the following two subsections, I’ll discuss toolmaking and skill acquisition in extant hunter-gatherers to illustrate and expand on these ideas.

* + 1. Toolmaking and the form of cultural learning

Toolmaking is an interesting case because, on the one hand, from around 2 MYA to 250 KYA, we see a lot of change in several cultural traits (food preparation, foraging, control of fire) (as well as morphological and life-history changes). On the other hand, however, whilst there was some change, relatively speaking, toolmaking stagnates (Sterelny 2014; Finkel and Barkai 2018; Machin 2009; though see also Gallotti and Mussi 2017). Such stagnation in the diversity and development of cultural traits and artefacts is often termed cultural conservatism.[[14]](#footnote-14) Not only did the development of stone tools stagnate over time, but we can also see that functionally irrelevant features are being preserved over several generations (Shipton 2019).

Why do we see conservatism when it comes to toolmaking? Whilst the often mentioned demographic and economic factors will surely have been relevant (see Sterelny 2021b for an overview; Steele and Shennan 2009; Ofek 2004), Finkel and Barkai (2018) are right to point out that it remains puzzling why we do see rapid change in other cultural traits. After all, demographic and economic factors should also impact the domains where we do see rapid change in cultural traits. They suggest that rather than hominins being *unable* to innovate, conservatism might have been an adaptive solution and choice. Not only did the high complexity of tools require high-fidelity learning mechanisms, but in addition, these tools were central to hominins’ way of life. They were essential for food preparation but plausibly served as multi-purpose tools. Producing them might also have brought social benefits. This illustrates how social groups solved the trade-off between innovation and individual learning and conservatism and deference in cultural learning differently for different cultural traits. Whilst for some traits, innovation was encouraged, in toolmaking, it wasn’t. Based on this, Finkel and Barkai (2018, 12) propose: “Regarding Acheulean handaxe persistence, we suggest that the bias to imitate majority behaviour that then evolved into social norms may provide a plausible explanation.” The suggestion being that biased social learning led, after a certain period of time, to toolmaking gaining in social meaning and importance and for social norms to be established in relation to it.

I offer a slightly different picture: Rather than a social norm evolving out of agents’ social learning practices, conservatism in toolmaking is already reflective of there having been a norm that coordinated agents’ social learning efforts. Such epistemic coordination-norms would have instructed agents to defer heavily to others when it comes to toolmaking but perhaps be more explorative regarding other cultural traits. Learning how to make tools via individual learning mechanisms will seldom have been successful. However, employing trial-and-error learning and the right junctions in the learning process might nonetheless have been productive, e.g., in furthering an agent’s understanding of the toolmaking process. But it’s because of their importance to hominins' way of life and their technical complexity (and other contextual factors) that, for the most part, little innovation was encouraged (see Shipton and White 2020 for another view that locates the emergence of normativity in social learning).

Significantly, how this trade-off was managed changed given a change in external conditions — recall, we do see both gradual change in toolmaking during the Acheulean and, additionally, flickering if unstable change in cultural traits (including toolmaking) from 800 KYA (Sterelny 2021b, chap. 1; Gallotti and Mussi 2017). This also indicates that the solution to this trade-off was social, as more hard-wired cognitive solutions would lack the required flexibility. So, overall, in the case of toolmaking, the relative absence of innovation in a time of rapid cultural change is evidence of coordination-norms.

The case of toolmaking thus also provides our view with archaeological evidence — i.e., the mentioned observations about conservatism in toolmaking. As Finkel and Barkai point out, a norm-based view is uniquely placed to account for these findings, as the difference in change in cultural traits isn’t explained by demographic and economic factors. Here, I’ve added another interpretation to the existing norm-based explanations: Rather than norms emerging from biased cultural learning, cultural learning itself is already reflective of there having been norms at play.

* + 1. Skill acquisition and epistemic coordination-norms

There exists a fairly large ethnographic literature on skill acquisition in extant hunter-gatherers that’s — with some reservations — taken to be informative regarding early human evolution (see, e.g., Lew-Levy et al. 2020; 2017; Hewlett et al. 2011 for overviews). The general picture we find there is influenced by what’s sometimes called a multistage learning model (Reyes-García, Gallois, and Demps 2016), where the form of cultural learning is specific to the learner, model, and the skills to be acquired. In particular, how learners acquire skills depends heavily on their age and the complexity of the skills to be acquired.

The ethnographic literature seems to support this model: Children are sometimes taught by others who are of a similar but slightly older age group. The thought here is that similarly aged children will be better able to estimate the learners’ capabilities and teach them accordingly. Learning amongst children is also often collaborative, and often takes place playgroups. More generally, we see a lot of unsupervised and explorative learning centred around play and autonomous exploration. Adults provide material support in the form of toys or simply from the output that they generate via their day-to-day activities, as children often accompany adults and “participate” in their tasks. Children thus often learn via observation, imitation, play, and trial-and-error. The complexity of the acquired skills increases with age and capabilities. For example, big game hunting and complex material culture are explicitly taught once learners reach adolescence, and these skills are perfected only in adulthood. Innovation then also mostly starts in adulthood.

Now, whilst the thought that social groups would need to coordinate on the form of cultural learning might seem more plausible for the more involved kinds of teaching we see in adolescence and into adulthood, one might be sceptical that there’s much of a need for them with children. After all, children are said to mostly learn via observation, play, trial-and-error, and imitation. Additionally, there seem to be cues regarding both content and form: Cues to what learners are supposed to learn, e.g., what adults spend time on and from whom they should learn, e.g., those that make tools without failures. Children’s learning environments will also be structured in ways conducive to acquiring knowledge via these mechanisms, as they’re, e.g., saturated with the outcomes of others’ activities. This seems particularly important as *some[[15]](#footnote-15)* early and relatively simple instances of cumulative culture might have been transmitted precisely in such ways. So, where do epistemic coordination-norms come in here? [[16]](#footnote-16)

Let me first acknowledge that it does strike me that this kind of outlook gets something right: There seem to be specific learning episodes, e.g., when a child learns via observing what their parents are doing, where the need for social norms isn’t obvious. Here, it simply seems that the child acquires the trait via observation learning and not through a norm-based mechanism.

Overall, I take it that this isn’t problematic for my view, as I’m not arguing that social norms played a role in each episode of cultural learning or that every learning strategy is norm-based (although I do take it that some central ones are). What I’m rather arguing is that epistemic coordination-norms more generally regulated cultural learning’s content and form. In other words, I think the focus on specific episodes of cultural learning and the mechanisms and strategies we find there can obscure the bigger picture, i.e. that cultural learning is a group-wide social practice upheld by the coordinated behaviour of several agents. And as such, it’s regulated by epistemic coordination-norms.

To bring this out, let’s change our focus away from single episodes of cultural learning and focus on the more general patterns I described above: Cultural learning is specific to learners, models, skills to be acquired, and many other contingent and contextual factors. There are group-wide patterns in the form of cultural learning. For example, children are often encouraged to learn individually and collaboratively in learning environments structured by adults’ activities in hunter-gatherer populations, whilst elsewhere, children are sent to public schools that have clearly specified curricula. Regarding content, we find certain kinds of cultural traits and techniques being passed on and others elsewhere. These patterns are sensitive to these contextual factors, are often specific to the respective social groups and change over time. For example, in hunter-gatherer populations, children will sometimes be explicitly taught by other children, depending on the skill to be acquired, or they’ll be taught by adults for other skills, perhaps only when they reach a certain age, are especially talented, or if adults aren’t busy otherwise — say because they’re in a season of economic surplus. Relatedly, school curricula and, more generally, how public schools are structured change depending on similar contextual and often group-specific factors.

My suggestion here is that these patterns in the form[[17]](#footnote-17) of cultural learning are at least partially reflective of the ways in which social groups “choose” to organise themselves, in particular, how they organise and structure the transmission of information within their group. In other words, these patterns in the form of cultural learning are reflective of social norms being operative. The need for epistemic coordination-norms here is due to these contextual and contingent factors heightening the chance of coordination failures: For any particular individual, pre-coordination, it’s incredibly hard to evaluate how they should respond to these contextual factors so that the group-wide transmission of information can be successful, in part because the chosen behaviour needs to match those of others. Under which conditions should you choose to leave your kid to your own devices rather than actively teaching them? If you’re teaching them, what do you teach them about (e.g., this step in the toolmaking process or where to hunt for small game) and when? What kinds of epistemic goods do children need to acquire here — does mere knowledge suffice, or do they need understanding? Does your learning strategy match up with those of others in a productive way?

The fact that relatively simple learning strategies are successfully applied is, on my picture, a product of social groups having successfully coordinated on when agents are allowed and encouraged to use these kinds of strategies over, e.g., more resource-intensive ones, such as explicit teaching. In other words, epistemic coordination-norms might not explain every single episode of cultural learning, e.g., that a child learns from their parents via observation. But they do (partially) explain why children, under particular conditions, tend to learn via observation rather than some other available strategy. Epistemic coordination norms thus explain the patterns we see in the form of cultural learning — patterns that differ between groups, time, and environments and depend on a variety of contextual factors.

The picture I advocate is thus one where the form of cultural learning doesn’t just emerge as a result of environmental pressures or of learners simply spontaneously choosing a strategy. Rather, the form of cultural learning is more of a collective response to the challenges that the transmission of information poses. The patterns we see in the form of cultural learning aren’t reflective of agents passively succumbing to the demands of their environments and their contextual intricacies — they’re reflective of groups actively responding to them by structuring cultural learning in specific ways. The fact that children, in some contexts, tend to learn via observing their parents isn’t an individualistic response to environmental conditions but reflects how their group chose to organise themselves and their cultural learning.

My view thus predicts that when we’d ask members of these groups why cultural learning takes the form it does, rather than some other form, they’d minimally tell us that this is how things are done around here. This is the way their social group is organised. More knowledgeable agents might also give us some of the contextual and contingent reasons why cultural learning takes the form it currently does. Additionally, we’d find relatively stable between-group differences in the form of cultural learning that correspond to the different influences of the kinds of contextual factors I’ve described.

Of course, more work needs to be done to substantiate these claims. What I’ve hoped to show here is an initially plausible diagnosis of the patterns we see in cultural learning across and between different social groups. Ethnographic research on hunter-gatherers might also prove valuable here, as empirical means of testing the involvement of social norms in various behaviours exist (see, e.g., Bicchieri et al. 2023). A better understanding of whether and how social norms regulate cultural learning in extant hunter-gatherer populations is thus attainable.

In summary, I’ve proposed that the form of cultural learning, under which conditions agents learn from others, from whom they learn, which strategies or mechanisms they’re incentivised to employ and how their learning environments are structured, is subject to epistemic coordination-norms. Sometimes, this will mean that particular learning strategies are norm-based, as is plausibly the case in selective social learning. However, at other times, these norms more generally help social groups balance their cultural learning efforts against various contextual factors, as the toolmaking and skill acquisition examples illustrated, resulting in context-specific patterns in cultural learning. Plausibly, epistemic coordination-norms have performed this function since the early advent of cumulative culture.

* 1. A fictionalised example, again

Let’s return to our toy example from section 3.2, where a juvenile early ancestor A is looking to acquire a cultural trait, specifically toolmaking, to summarise our findings. Whilst it’s plausible that the relative importance of epistemic coordination-norms correlates with the degree of specialisation, division of labour, group size, and complexity of traits (and some other factors discussed in section 3.4), my suggestion is that these norms structured early instances of cultural learning in the following ways:

* First, as discussed in section 3.3, our early ancestor A would be guided and assessed by their parents (and other, more experienced agents). In turn, these agents’ guidance and assessments would be influenced by and reflective of norms that set a range of relevance regarding the contents that are to be acquired by A. Meaning such norms would specify that toolmaking was of central importance for A to acquire, which toolmaking-techniques A needs to master, which materials (and where to get them) A should be familiar with, and what purposes these tools would have once they were produced etc. These norms would also set standards for what counts as a good instance of whatever tool A sought to build.
* Second, as discussed in section 3.4, another kind of epistemic coordination-norm would additionally influence A regarding whom they should learn, when they should do so, what their learning environment is supposed to look like, and which strategies they should employ. Depending on the context at hand, such norms would also instruct A to defer heavily to others and for A to be taught explicitly, e.g., if it’s a very complex or dangerous tool, or to learn with other learners via play or collaborative learning, if the tool’s relatively simple or A’s part of a talented friend-group.

In summary, then, epistemic coordination norms were plausibly operant in early instances of cultural learning. With their assistance, early humans overcame the difficulties posed by potentially fast-changing, contingent, and heavily contextual influences on cultural learning and coordinated on its content and form.

1. **The Evolution of *Social* Norms**

The account presented above is relevant as it not only has implications for cultural learning but also for views on the evolutionary emergence of social norms. If what I said above is on track, then coordination in cultural learning was one of the selection pressures that led to social norms' emergence. To substantiate this, this section aims to position my view in relation to one of the most prominent views on the market — Jonathan Birch’s (2021a) – and, in doing so, show how focusing on *epistemic* coordination-norms gainfully adds to it. What results is a coherent, albeit rather general, account of the early evolution of social norms.

* 1. Birch’s Skill-Hypothesis

Birch advocates for what he calls the Skill-Hypothesis: That there’s both a deep psychological and evolutionary connection between normative cognition/norms and practical skill. On this view, a norm is just any standard of correct or appropriate behaviour, whilst normative cognition is the capacity to notice failures to conform to a norm, to feel affective pressure to secure compliance with a norm, and to know how to do this, e.g., via correcting one’s own or others’ behaviours (Sripada and Stich 2006).

On the psychological side, the connection between normative cognition and skill consists in complex skills being guided by norms of correct performance. The view here is that agents employ a cognitive control model which “represents those aspects of the causal structure of the situation relevant to successful execution of the skill”. Agents will feel affective pressure if they deviate from the model’s representation/prediction of how the skill is to be executed. The model thus “represents a norm of correct performance in the pattern of mismatches that trigger affective pressure to make an adjustment” (Birch 2021a, 8).

On the evolutionary side, the skill-hypothesis maintains that: “The capacity to internally represent action-guiding norms of correct performance evolved as a solution to the distinctive problems of standardizing, learning and teaching complex motor skills and craft skills, especially skills related to toolmaking.” Birch claims the cognitive control models described above are only found in our lineage (but see Westra and Andrews 2021a; Birch 2021b). Within that lineage, H. heidelbergensis is supposed to have evolved such control models, as evidenced by the symmetry and precision of Acheulean bifaces. Birch hypothesises that the affective pressure to conform to the respective norms arose because of selection pressures related to the manufacture of such tools. Producing Acheulean bifaces was a collaborative activity that required division of labour and the standardisation of technique. The general idea is this: The division of complex labour comes with the coordination problem of making different kinds of labour (and their output) correspond correctly. The standardisation provided by norms solves this problem. Birch thus suggests that “standardized toolmaking is an archaeological marker of norm-guided skill execution”.

What I’d call coordination norms turned into — again, what I’d call — cooperation-norms because of active teaching. Teaching requires that agents compare others’ behaviours to one’s own model and react in ways conducive to bringing others’ behaviour in line with it. The cognitive control models expanded from self- to other-regulation.

How does this account of the evolution of norms compare to what’s been said above?

* 1. The Skill-Hypothesis compared

Let’s start with a difference between the two views:[[18]](#footnote-18) Birch’s explanandum slightly differs from mine. Whilst I care about *social* norms, Birch cares about norms more generally, which are just any standard of correct or appropriate behaviour. This broader notion harbours an ambiguity: To see this, consider that on Birch’s general understanding, the norms an agent might engage with can be entirely personal. An agent might have sought to promote a personal goal or acquire a personal good via their behaviour. Or they might have learned a skill largely by themselves, such that the norm that the control model encodes is independent of others’ behaviours or expectations. This might, for example, take place via reinforcement learning: An agent’s toolmaking behaviour is enforced if the tool is useable and disincentivised if it isn’t.

Notably, there’s a sense in which there are norms involved here. These might be instrumental norms that guide the agent in how to promote their aims (Tomasello 2014, chap. 2; Gonzalez-Cabrera 2022), or they might be technical norms that guide the agent in their skill-execution — over time and by trial-and-error learning, they might come to have their own standard for how to execute the skill in question. Such personal norms are implemented in the agent’s control models and set standards of correctness in relation to how an agent’s goals might be best pursued or how to best execute the skill. Plausibly, agents will feel affective pressure if they deviate from this norm as well here, as they won’t attain their goals, or the resulting tool won’t be useful to them. Plausibly, such personal normative cognition was selected for to allow for the flexible pursuit of goals and/or because of the complexity of skills and general behaviours that agents acquired (see Gonzalez-Cabrera forthcoming for more on the evolution and computational implementation of such personal norms.). We can read Birch as agreeing that there are such personal norms: “For an elite biker, approaching a corner too fast will feel wrong, motivating adjustment; too much pressure on the brake will feel wrong, motivating adjustment; steering that is too tight or too loose will feel wrong, motivating adjustment—and so on. […] This pattern of mismatches implies a standard of correct performance *by the agent’s lights*.” (Birch 2021a, 8, my emphasis) But I also take it that it’s independently plausible that such personal norms exist.

Importantly, it seems *conceptually* clear that such personal norms do not qualify as social norms in the sense under discussion here. There are different ways to spell out what would be needed for a norm to count as a social norm rather than the kind of personal norm I outlined above. We might, for example, say that agents need to share the goals they’d like to promote (Tomasello 2014, chap. 3; 2016) or that a sufficient subset of agents of a group need to expect from each other that they’ll conform to a norm and that they prefer to conform to that norm because of this (Bicchieri 2005), or that subset of the group needs to share the relevant normative attitude and know about this (Brennan et al. 2013). Outside of my commitment to social norms function, I don’t seek to commit to any of these accounts. But it seems clear that on all of them the personal norms I’ve discussed above don’t qualify as social norms. Birch’s account — because of its understanding of norms as any standard of correctness whatsoever — doesn’t explicitly make this distinction.

This distinction is also relevant to the question of whether non-human animals (and our LCA) possess normative cognition. Whilst Birch remains sceptical, he also concedes that: “I am happy to see the evolutionary origin date for model-based cognitive control pushed backwards by new evidence. I may have overestimated its recency.” (Birch 2021b, 255). The distinction highlights that we cannot just ask whether non-human animals and our LCA possess normative cognition simpliciter — and whether we should, therefore, push back the timeline of its emergence — but whether it stands in relation to personal or social norms — and whether there are therefor qualitative differences in the evolutionary trajectory of normative cognition that we should account for. I’ll say a bit more on this question in section 5.

When it comes to the evolutionary trajectory, the view that suggests itself is the following: Personal norms and the associated cognition were evolutionary precursors to the kinds of social norms I’ve been interested in (see Gonzalez-Cabrera 2022 for a similar view). Agents were first able to conform to personal norms, the social component only came in later.

Why did norms turn from being personal to being social? Here, Birch and I can agree that there’s a sense that this was due to selection pressures stemming from coordination problems. Birch takes it that this was due to the division of labour in the execution and transmission of complex skills — such as toolmaking — which required standardisation that norms provided. As the above details, I agree that the execution and transmission of skills indeed posed problems solved by coordination-norms. However, the upshot of the preceding sections is that a more pluralistic picture presents itself. First, early norms didn’t solely arise in relation to coordination problems regarding the execution and transmission of complex *skills* — knowledge-how — but also concerning knowledge-that. For example, early humans’ natural history knowledge was a necessity for successful foraging (see Pickering 2013 for ambush-hunting). Second and perhaps more importantly, early humans were confronted with coordination problems related to different aspects of their lives. Toolmaking was plausibly one of them, but the content and form of cultural learning, as described in sections 3.3 and 3.4, was another. The combined set of these coordination problems required agents to employ social rather than personal norms. Consequently, early social norms were unified in function — they all functioned to coordinate complex social interactions — but pluralistic in content: Some set standards of correctness for toolmaking, and others guided agents in cultural learning.

To see why one might favour such a pluralistic view, consider again the role such coordination-norms played in early reason exchanges as described in section 3.3. It’s because agents had coordinated on what makes a reason more weightier than another in particular contexts that such reason-exchanges were possible (Tomasello 2014; Mercier and Sperber 2017). Now, given the available evidence, it seems difficult to ascertain whether the exchange of proto-reasons, specialised social learning, or skilful behaviour was the most relevant pressure for coordination-norms to evolve.[[19]](#footnote-19) Did our ancestors first make complex tools, exchange (proto-)reasons, or learn from each other? Whilst we might try to make a case for each one of these to somehow be more important than another, what is more plausible is our ancestors engaging in all of these behaviours at roughly the same time. For example, we likely exchanged (proto-)reasons about where and how to hunt, produced complex tools and learned from others how to do either. The picture I advocate for is thus one where early humans were faced with various coordination problems and where coordination-norms evolved as a response to the combined set of these problems.

The bigger picture to which both Birch and I can subscribe to is one where norms change from being personal to becoming social due to the importance of coordinating a variety of aspects of their lives.

1. Conclusion

In summary, in the first part of the paper, I’ve argued for a view of the evolution of cultural learning and social norms in which epistemic coordination-norms played an important role in early instances of cultural learning. In particular, these norms were important for agents and groups to be able to coordinate the contents and form of cultural learning, roughly speaking, what is to be learned and how this is to be done. I additionally suggested that such a view supports a more general view of the evolution of social norms where a plurality of coordination problems played an important role in their emergence.

Whilst the paper provides a first — hopefully informative — pass at linking the evolution of social learning with the evolution of social norms and social epistemology, there’s a need for theoretical substantiation and further empirical support. For example, I’ve mentioned how extant hunter-gatherer populations and whether/how their cultural learning is regulated by social norms would prove to be a valuable source of insight. Similarly, assessor-teaching and selective social learning, as well as their relation to social norms and importance to the early evolution of cumulative culture, should be considered in more detail.

In addition, the following points are of considerable importance:

1. There’s a question about the likely gradual change from coordination-norms to cooperation-norms? Was this due to the active teaching of non-kin, as Birch (2021a) mentions? Or rather due to factors related to either an increase in the size of and competition between social groups and/or to the demands on indirect reciprocity (Tomasello 2016; Sterelny 2021b)?
2. Non-human animals have only found little consideration in these pages — mainly for reasons of space. But there are at least two considerations relevant to the animal normativity literature (e.g., Andrews 2020; Fitzpatrick 2020; van Schaik and Burkart 2018) that are worthy of further thought here:
   1. It’s broadly accepted that some non-human animals, and certainly great apes, can flexibly pursue and track their own and others’ goals and self-monitor their decision-making processes (see for an overview Tomasello 2014; 2016). But do non-human animals achieve this by employing something like personal norms? More work is needed on both how one might empirically investigate the existence of such norms and how they might be cognitively implemented.
   2. Some take it that animals, too, employ cultural learning. In light of the above, rather than considering whether they employ some sort of cooperation-norms as some in literature seek to do (e.g., Andrews 2020), it’d make sense to investigate whether action is being coordinated by means of coordination-norms — especially as there’s a rich literature on action-coordination in non-human animals (e.g., Heesen and Fröhlich 2022; Genty et al. 2020). Positive findings would provide additional support for animal’s capacity to learn culturally, whilst negative findings — either with regards to personal or coordination-norms — might provide at least a partial explanation of why they lack cultural learning.

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1. A caveat on this: Whilst the notion of social norms that I employ is largely psychologically neutral, I do require that social norms are able to guide agents in their behaviour and that they do so, at least in part, by specifying which behaviours are appropriate, permissible, or obligatory. Plausibly, this means that these norms (or their content) must be represented by or encoded in the agent’s cognitive architecture. I remain neutral about how this is to take place. [↑](#footnote-ref-1)
2. Several contemporary accounts of the evolution of socially normative phenomena focus on normative *cognition* rather than social norms per se (e.g. Sripada and Stich 2006; Birch 2021a; Heyes 2022). I prefer to use the notion of “social norms”, not least because what does and doesn’t count as “normative cognition” is heavily influenced by what kind of social norm this sort of cognition is thought to be aimed at. [↑](#footnote-ref-2)
3. Cooperation-norms are also often taken to be helpful because they disambiguate social interactions, i.e., they help define what counts as cooperating, as well as eliciting motivation for third-party sanctioning (see, e.g., Richerson and Boyd 2008; Sterelny 2021b) [↑](#footnote-ref-3)
4. Coordination norms are roughly similar to what Bicchieri (see Bicchieri 2005, chap. 1) calls descriptive norms and to what Lewis (1969) calls ‘conventions’. The differences need not concern us here. [↑](#footnote-ref-4)
5. Henderson (2020) makes the point that social epistemic norms might function as coordination-norms for some and as cooperation-norms for other individuals, depending on the context. I take this to be true. My point in the following will be that these norms predominately functioned as coordination-norms in the early evolution of cultural learning. [↑](#footnote-ref-5)
6. If one takes it that practical knowledge reduces to propositional knowledge, then all social epistemic norms will likely be about how we form and share beliefs (see e.g. Williamson and Stanley 2016). What I’ll argue below is compatible with but not committed to such a view. [↑](#footnote-ref-6)
7. There might be more things that social groups need to coordinate on for cultural learning to succeed. I’ll focus on these two factors to make the general point that coordination-problems address by social epistemic norms were of importance to early cultural learning. [↑](#footnote-ref-7)
8. There are similarities between assessor-teaching and natural pedagogy (Csibra and Gergely 2011; 2009). For reasons of space, I won’t expand on this, although I take it that some of the points below that apply to the former also apply to the latter. [↑](#footnote-ref-8)
9. One might be sceptical whether assessor-teaching is supported by the relevant ethnographic evidence, although evaluative feedback is being discussed in, e.g., Lew-Levy (2017) and Jordan (2014). I think the more general point that I’ll make below, that social groups need to coordinate on the contents of cultural learning, stands nonetheless. [↑](#footnote-ref-9)
10. This notion stems from feminist epistemology. This literature is helpful for the aims of this paper in that it uncovers how social norms impact what and how we know things. However, feminist epistemologists care about a slightly broader phenomenon — what they often call “social structures” or “social practices” (see, e.g., Sertler 2022; Haslanger 2018; 2016) — that also include things like in-group power dynamics, social roles etc. They also focus on how such social structures can be and often are unjust. This is not something I’ll consider here — though it would be interesting for future work to address. [↑](#footnote-ref-10)
11. My thanks to an anonymous reviewer for bringing this to my attention. One might worry that such an increase in standardisation might be due to a copy-the-most-frequent heuristic. This is possible, and further research that distinguishes between possible norm- and heuristic-based views to explain standardisation would be valuable. However, the more general point taken from Birch remains: There was a need to coordinate on what counts as a good tool, no matter how it was produced. Both a norm- or heuristic-based mechanism must stand in relation to that norm to succeed. [↑](#footnote-ref-11)
12. One might be sceptical whether the exchange of proto-reasons is possible without full language. But note that even if it does, this only means that coordination around standards of correctness for *epistemic* capacities became relevant later in human evolution. The more general point, that there was a need to coordinate on standards of correctness for cultural traits more generally, remains. [↑](#footnote-ref-12)
13. Strategic approaches (e.g. Henrich 2015; Hoppitt and Laland 2013; Laland 2004) maintain that selection (i.e. when to learn and from whom) occurs only after all the information has been taken in and evaluated in accordance with a particular (set of) rule(s). Selection thus occurs at the output stage — when the agent is said to decide in light of a rule or strategy. The mechanisms employed here are domain-specific — i.e., they’re specialised to operate within the domain of social learning. In contrast, Heyes’ attentional approach maintains that in most instances, selection is not facilitated by decisions made concerning rules specific to social learning but rather by low-level, automatic, attentional processes. The idea is that agents’ attention is differently employed — for example, they might pay more attention to prestigious individuals than others — thus allowing for social learning to be selective. The mechanisms employed here are domain-general — they’re important to all learning contexts, and we can find them in a variety of non-human animals as well. However, Heyes agrees that human social learning is, at least sometimes, made selective through the employment of metacognitive social learning rules: “i.e. by conscious, explicit, reportable, domain-specific rules that represent who knows” (Heyes 2018, 106) and when we should learn from them. To be clear, there are important differences between the strategic and attentional approaches, e.g. concerning selection mechanisms, evolutionary history and others, but the point here is that both subscribe to the idea that selective social learning is guided by norms of some kind. [↑](#footnote-ref-13)
14. It should be noted that cultural conservatism in toolmaking might be exaggerated, as soft material technologies and more complex tools (because of their rarity) disappear from the material record more frequently than others. There’s also documented change within Acheulean toolmaking (see, e.g., Kuhn 2020). This isn’t the place to arbitrate on the degree of cultural conservatism in toolmaking. But those sceptical of the more conservative view should still appreciate the more general point I make below, that the form of cultural learning is specific to different cultural traits and likely governed by social norms. [↑](#footnote-ref-14)
15. Presumably, some, though notably not all, early instances of cumulative culture were indeed attainable via the kinds of comparatively simple learning strategies I describe above. However, we do see fairly complex tools and evidence of big game hunting — both require fairly complex skills — from relatively early in human evolution as well. This favours a picture where a mixture of learning strategies was employed — what strategy was chosen depends on the kinds of contextual factors that I discuss. [↑](#footnote-ref-15)
16. My thanks to an anonymous reviewer for pushing me on this point. [↑](#footnote-ref-16)
17. I take it the following points are also valid for the content of cultural norms: Here, too, we find patterns regarding the contents of cultural learning — that certain cultural traits are transmitted in some groups and others elsewhere. Again, I take it that this is reflective of the ways in which social groups coordinated on their range of relevance, i.e. which traits agents are supposed to acquire. [↑](#footnote-ref-17)
18. There’s another, less important difference: On Birch’s account, norms are represented in the pattern of mismatches that trigger affective pressure — so it’s the cognitive control models that implicitly and inflexibly encode norms. On the view I prefer, norms rather stand in relation to (shared) goods or goals. I’m, however, happy to say that cognitive control models are responsible for pursuing these goods or goals (see Railton 2021 or; Tomasello 2014 for a view similar to this). Birch (2021b) has acknowledged this as a legitimate and closely related variant of his view, so I won’t further discuss this. [↑](#footnote-ref-18)
19. This ignores cooperative breeding, which might also have posed coordination-problems (Burkart, Hrdy, and Van Schaik 2009). Similar points also apply to big game hunting, as Sterelny (2021a)discusses. [↑](#footnote-ref-19)