

# The Transmission of Cumulative Cultural Knowledge — Towards a Social Epistemology of Non-Testimonial Cultural Learning

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## Abstract

Cumulative cultural knowledge [CCK], the knowledge we acquire via social learning and has been refined by previous generations, is of central importance to our species' flourishing. Considering its importance, we should expect that our best epistemological theories can account for how this happens. Perhaps surprisingly, CCK and how we acquire it via cultural learning has only received little attention from social epistemologists. Here, I focus on how we should epistemically evaluate how agents acquire CCK. After sampling some reasons why extant theories cannot account for CCK, I suggest that things aren't as bleak as they might look. I explain how agents deserve epistemic credit for how CCK is transmitted in cultural learning by promoting a central need of their social group: The efficient and safe transmission of CCK. A good initial fit exists between this observation and Greco's knowledge-economy framework. Ultimately, however, Greco's account doesn't straightforwardly account for CCK because of its strict focus on testimony. I point out two issues in the framework due to this focus. The resulting view advocates giving epistemic credit to agents when they act to promote their communities' epistemic needs in the right way and highlights the various ways in which agents come to do this.

**Keywords:** *Transmission of Knowledge, Cumulative Culture, Social Learning, Testimony, Epistemic Dependence*

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## 1. Introduction

Cumulative cultural knowledge [CCK], the knowledge we acquire via social learning and has been refined by previous generations, is of central importance to our species' flourishing — being able to gain and share CCK from and with others is nothing less than a prerequisite for our way of life (see e.g. Henrich 2015; Sterelny 2012). Considering its importance, we should expect that our best epistemological theories can account for how this happens.

Perhaps surprisingly, CCK and how we acquire it via cultural learning mechanisms have received little attention from epistemologists (but see Levy and Alfano 2020; McMyler 2022b; 2022a). While many exciting questions surround this novel research field, I here focus on how we should epistemically evaluate how agents acquire CCK in cultural learning. In particular, I ask whether, why and when *individuals* deserve epistemic credit in cultural learning interactions where CCK is transmitted. This is an important question, as there's reason to believe that extant theories cannot account for why or how this happens. For example, Levy and Alfano (2020 henceforth [L&A]) suggest that according to mainstream epistemological theories, agents don't deserve epistemic credit when acquiring CCK through social learning — the dispositions that allow them to do so are seen as epistemic vices rather than virtues.

I suggest that agents deserve epistemic credit for how CCK is transmitted in cultural learning by promoting a central need of their social group: The efficient and safe transmission of CCK. I highlight how there's a good initial fit between this observation and John Greco's (2020; 2016) knowledge-economy framework. On this view, there are two ways of coming to know: Knowledge-generation, where agents come to know by themselves, and knowledge-transmission, where they come to know by depending on others. Agents are said to deserve credit by virtue of how they promote their group's aims (to generate new knowledge or transmit it within the group) in the right ways. However, Greco's framework is focused on testimony. The view thus falls short of capturing the pluralism and complexity of cultural learning. In particular, I show that, whilst various mechanisms promote a group's need to safely and efficiently transmit knowledge, not all instances of CCK-transmission involve agents depending on others. And even if they do, CCK-transmission doesn't necessarily involve a shared intention to share knowledge.<sup>1</sup>

After discussing the ramifications of these two points for how agents deserve epistemic credit, the resulting picture posits that learners and models deserve credit for playing their part so that the kinds of social practices that allow for the transmission of CCK within epistemic communities are

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<sup>1</sup> In a recent paper, Heather Battaly (2022) argues that the knowledge-intention is not required for knowledge-transmission via *testimony*. As my focus here is on non-testimonial social learning, I remain agnostic about whether Greco's account is accurate for testimonial knowledge-transmission.

successful. For learners, this requires that they're sensitive to the question of which cultural learning strategy they're to employ. For *models*, this can amount to intending to share their knowledge but it might also simply amount to act knowledgeably in public spaces. When agents play their part so that these social practices are upheld they act in the right way and are thus deserving of credit.

The article is structured as follows: In section 2, I introduce the notion of CCK and how we acquire it via cultural learning. I also introduce and motivate the article's research question. In section 3, I explain why cultural learning promotes a group's epistemic need to safely and efficiently transmit CCK. In section 4, I introduce Greco's framework and highlight how — in principle — it'd be a great fit to account for the epistemology of CCK. In section 5, I point out how Greco's focus on testimony obscures the plurality of how CCK is transmitted within social groups. In section 6, I discuss how both learner and model deserve epistemic credit based on the insights of the previous sections. Section 7 concludes.

## 2. Cumulative Culture and the Epistemology of Cumulative Culture

### a. Cumulative Culture

Human culture is said to be cumulative: Cultural traits — technologies, social practices, and, significantly, knowledge — are being refined by each generation. Culture is cumulative in that the refinements of past generations are incrementally built up: Modifications of cultural knowledge or techniques add up to cumulative culture (Henrich 2015; Mesoudi and Thornton 2018; Sterelny 2021, chap. 1). As an example, consider the moon-landing — this too was the outcome of cultural traits being refined by a variety of groups over several generations. As Dean et al. (2014, 285) put it: *“This crowning achievement of human endeavour was not planned and devised by Armstrong alone, but by a huge team, deploying ballistics, electronics, materials science and radio communication technologies reliant on theoretical and experimental research carried out over several centuries.”*

Alternatively, consider Inuit clothes-making, as described in Henrich (2015) and summarised by L&A (Levy and Alfano 2020, 892f): *“The Inuit stayed warm and comfortable by making clothing from caribou skin, which has better insulation properties than seal or polar bear fur. But not just any caribou skin would do: it had to be harvested at the right time of year, and then prepared by repeated stretching, scraping, and moistening. Subsequently the hides had to be shaped in ways that maximized heat retention while allowing moisture to escape. Footwear was equally specialized, consisting of five separate layers: three different layers of stockings, each with a different design, then two different kinds of boots.”* Much like the moon landing, how the Inuit make their clothes is the outcome of a several generations-long process of modification and innovation.

In line with this, Tennie et al. (2009; Bandini et al. 2021) characterise cumulative culture via a ‘zone of latent solutions’ [ZLS]. An ability or a belief (or, strictly speaking, its content) is part of an individual's ZLS if it could be acquired by individual learning. The kinds of knowledge, abilities,

social practices, etc. that humans need to acquire quickly exceed their ZLS. Cumulative culture is outside of an individual's ZLS because of reasons of scope and complexity, but also because cumulative culture is causally opaque, occurs in fast-changing environments, and is dangerous if not exercised correctly (see, e.g., Sterelny 2021, chaps 1 & 2).

Because of this, cumulative culture requires high-fidelity social learning mechanisms. Social learning is learning that is assisted by observation of or interaction with another agent or its products (Heyes 2021; Hoppitt and Laland 2013). Humans are equipped with specialised mechanisms — sometimes also subsumed under cultural learning — that allow us to learn from others socially and, in turn, improve on cultural variants (Sterelny 2021; Henrich 2015; Tennie, Call, and Tomasello 2009). It's because cultural knowledge and techniques were passed on with such high fidelity and, in turn, improved over generations that things like the moon landing (or vaccines, nuclear energy, or ChatGPT, etc.) have been possible.

A variety of mechanisms are employed in cultural learning. By way of example, here are three significant ones: Imitation learning, selective social learning, and active teaching. In imitation learning — a type of observational learning — learners not only learn from observing the results of other's actions — as is the case in emulation learning — but also learn from the specific behaviours themselves. Selective social learning describes *dispositions to discriminate when we should learn from whom* — what Heyes (2018, chap. 5) calls “when-” and “who-selectivity”. For example, we tend to learn from prestigious, successful models or conform to the behaviour of the majority — what's sometimes called imitation, success-, prestige-, conformist-bias (Henrich 2015; Laland 2004). In active teaching, the teacher actively intends to convey their knowledge to the learner, and the learner acquires knowledge based on various methods that the teacher(s) employ. These specialised learning mechanisms are embedded in socially scaffolded learning environments conducive to transmitting cumulative culture. These learning environments are, for example, structured by social norms that instruct agents whom to learn from or, more generally, by institutions like public schools or the apprentice learning system (Sterelny 2012; 2021; Henrich 2015; Tennie, Call, and Tomasello 2009).

Cumulative culture is a wide-ranging and broad notion: It encapsulates abilities, techniques, social practices and knowledge, originates in the evolutionary study of culture and social learning, and is being used in various research fields (Mesoudi 2016; Tehrani, Kendal, and Kendal 2023). So, we should expect some unsharp borders. Here, I'm mainly interested in cumulative cultural knowledge [CCK], which I understand to be propositional knowledge that past generations have refined, is outside of an individual's ZLS, and is passed on via cultural learning (such as imitation). CCK is still an extensive notion. For example, it includes much of our scientific knowledge — e.g., the kind of knowledge that was required for the moon landing to work out — but also our knowledge

about the social world — e.g. which customs or social norms we have to adhere to in specific contexts (Sterelny 2021, chap. 1) and much else. It should be mentioned that cumulative culture also encapsulates cultural knowledge-how — i.e., cultural abilities and techniques that are being passed on via cultural learning — and perhaps even things like tacit knowledge. I assume much of what I say below about CCK and its transmission also applies to cultural abilities and techniques. But whilst questions related to cultural knowledge-how are of interest, I'll restrict myself to considering cases of cultural knowledge-that, both for reasons of space and because the accounts I discuss below, share this focus.<sup>2</sup>

So, whilst there's more work to be done on the notion of CCK — work that I'd like to encourage — the present notion should be serviceable. Mainly because what will be of interest in the below is less about what CCK *is* and more about how CCK is *shared* within and between social groups. The larger picture that emerges is that humans are a cultural species: We depend on CCK in various ways for our survival and the success of our actions (see e.g. Henrich 2015; Sterelny 2012). Because of the importance of CCK for humans, we should expect that our best epistemological theories can account for how we acquire and transmit it via social learning.

### **b. Extant Epistemology and CCK**

Because of the importance of CCK to human flourishing, it is surprising that it has found little attention in extant epistemological theorising (but see Levy and Alfano 2020; McMyler 2022b; 2022a). Whereas testimony has been front and centre of debates in (social) epistemology, other cultural learning mechanisms are much more peripheral. There are various interesting epistemological questions that cultural learning poses, amongst them the following: What are the different mechanisms that make up cultural learning, and how do they function? Under which conditions should we employ these mechanisms, and when should we avoid them? What is the role of cultural selection mechanisms in the transmission of CCK? (see McMyler 2022a for additional research questions).

Here, I focus on a slightly different question: How can we capture how and when individuals deserve epistemic credit regarding their cultural learning efforts?<sup>3</sup>

There's reason to believe that extant epistemological theories struggle with this question. To see this, consider first that on standard accounts in social epistemology, the transmission of information and knowledge is essentially dyadic: A speaker A testifies something that a speaker B

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<sup>2</sup> Of course, if one takes knowledge-how to reduce to propositional knowledge (see, e.g., Williamson and Stanley 2001), this particular aspect of what we take CCK to entail becomes less relevant. I remain neutral about this question here.

<sup>3</sup> I take it that we could use other evaluative notions in present-day epistemology to gauge whether agents' conduct in cultural learning is epistemically appropriate. The reasons why I'm using the credit-vocabulary are primarily practical, as most of the current debate on the epistemology of CCK is framed in these terms as well.

comes to believe, know, or understand. In contrast, cultural learning is much messier: Learners acquire CCK from several individuals by employing various learning mechanisms over a more or less lengthy period of time.

Additionally, cultural learning is neither purely an individual- nor a group-level phenomenon. Individuals' cultural learning mechanisms are only productive in learning environments structured by social groups. Yet these socially scaffolded environments require agents with these abilities to effectively transmit knowledge (McMyler 2022b; 2022a). As such, cultural learning requires us to spread credit between individuals and groups, something extant accounts do not tend to do (Levy and Alfano 2020).

Lastly, it seems that on most standard accounts, the kinds of strategies at the heart of cultural learning are seen as vices rather than virtues: Individuals aren't seen to deserve epistemic credit for employing them (Levy and Alfano 2020). Consider strategic social learning again — learning that's sensitive to questions of whom we should learn from and when — and imitation learning — learning from both the behaviour and its results.<sup>4</sup> Neither of these two strategies seems to constitute epistemic behaviour worthy of credit: We display substantial epistemic deference in conforming to behaviours of the prestigious or majority (Laland 2004), and we over-imitate others' behaviours to an instrumentally irrational degree (Nagell, Olguin, and Tomasello 1993; Hoehl et al. 2019). In doing so, we seemingly do not exercise our epistemic agency, as we don't learn by employing our own cognitive capacities. Agents are incurious and deferential; they follow others rather than making use of their own reasoning capacities (Levy and Alfano 2020, 898). According to L&A, credit also doesn't accrue on the model's side: People often have false beliefs about the knowledge they transmit. In addition, models are often dogmatic and insist on displays of epistemic deference — they're neither open-minded nor epistemically encouraging (Levy and Alfano 2020, 899).

L&A think that extant theories' inability to account for CCK is due to them not being sufficiently social. They hint at their preference lying with a multi-level account, where epistemic credit and competencies are spread between individuals and groups, and even non-agential factors, such as cultural selection (Levy and Alfano 2020, 910). Whilst I agree with L&A that extant theories cannot account for CCK, I disagree with their diagnosis of why this is so. This inability does not result from a lack of consideration for social factors but from a focus on testimony.

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<sup>4</sup> It should be mentioned that this picture of social learning is relatively narrow: It neither explicitly includes active teaching, hybrid-learning, or socially structured environments. Still, Levy and Alfano are correct in thinking that these two strategies are crucial to the transmission of CCK, and so our theories should be able to account for how we acquire knowledge through them.

### 3. A starting point for a new epistemology of CCK

Contrary to what's been suggested above, I propose that agents deserve credit for cultural learning because they promote a central need of their social group: The safe and efficient transmission of CCK.

As a starting point, consider that social groups are both practically (Tomasello et al. 2012; Sterelny 2021) and epistemically (Broncano-Berrocal and Vega-Encabo 2020; Hardwig 1985) interdependent: Agents depend on others for the success of their actions and beliefs. As such, social groups need individuals to be well informed about the actions and beliefs others will depend upon them for. From a group perspective, there's thus a *need* for individuals to gain CCK in safe yet efficient ways. So, when agents promote this need via cultural learning, they do act sensibly, epistemically speaking. A variety of reasons then speak in favour of cultural learning addressing this need.

The following are related to social learning being an *efficient* way to transmit CCK within and between social groups — this is especially important to real-world and, thus often, non-ideal circumstances, where agents' resources are often constrained and need to be divided between different tasks.

SL1. As mentioned, certain kinds of CCK are out of reach of agents' asocial learning capacities simply for reasons of bandwidth — learning what's needed would likely take an individual agent most of their lifetime. In addition, there isn't just too much that has to be known; it's also the case that what is to be known is too complex for individuals to figure out by themselves. This is why learning from and deferring to others' expertise is better.

SL2. Imitation and other kinds of observational learning are relatively unobtrusive and thus rather efficient: Models do not have to invest time and energy into actively teaching learners when they're being imitated — but of course, in teaching, they often do. In addition, learners do not have to exert themselves too much in imitating others; they do not need to critically or consciously consider what they're about to learn; rather, they unreflectively adopt it. This is conducive to effectively transmitting information between individuals.

SL3. Relatedly, selective social learning is efficient in at least two ways: First, agents learn from others mostly when they are uncertain, when individual learning is costly, or when the established behaviour is unproductive (Laland 2004) — that is when the benefit of doing so outweighs its costs. In addition, agents learn from prestigious or successful individuals precisely because this is an effective way of acquiring reliable information. Second, agents being selective in their social learning also ensures that they employ asocial learning strategies in the right circumstances — i.e. when it's cheap to do so or when social

learning isn't practical. In turn, this leads to agents innovating and acquiring new knowledge in circumstances where there truly is a need for doing so (Laland 2004). Thus, selective social learning helps balance promoting an epistemic community's need to transmit and acquire knowledge.

SL4. Lastly, social learning is efficient because learners likely learn from multiple agents over a certain period of time. A learner A can learn from models B, C, D, or E and thus aggregate the wisdom of the crowds. In addition, no particular agent bears the full responsibility of having to teach A.

So, according to SL1-SL4, the characteristics of cultural learning extant theories bemoan should be seen as features, not as bugs. They allow for the efficient transmission of CCK within social groups. Such efficiency allows agents to learn more and enables them to actively contribute to their communities' (epistemic and non-epistemic) needs.

What about the idea that agents should employ their epistemic agency, as extant epistemological views supposedly maintain? Should we not think that agents need to acquire knowledge more self-sufficiently?

This sentiment is inaccurate: Cultural learning is preferable to individuals acquiring or generating knowledge themselves. This generally holds because—unlike individual learning—cultural learning allows us to divide our epistemic labour in valuable ways, freeing agents to develop genuine expertise. Because of the division of epistemic labour and our ability to transmit its fruits effectively, CCK has become so extensive (Ofek 2004; Hill et al. 2014). Of course, there are plenty of instances where agents do and should employ their more individualistic cognitive powers— but these are limited and only arise against a background of culturally acquired knowledge. It's in the interest of social groups that agents employ the right strategy to acquire CCK—the claim here is that these will often be social rather than asocial. To see this, consider the following:

SL5. Depending on the content, learning can be dangerous. Considerable costs are involved if a learner tries to figure out which foods are edible, how to best climb a mountain passage, or navigate the oceans by themselves. Individual learning strategies—trial-and-error-learning, reasoning our way through it, are in such circumstances almost suicidal, as Sterelny (2021, chap. 1.6) notes.

SL6. Relatedly, there are cases with relatively large error intolerance: “where there is only one way to solve a problem, and departures from that one right recipe are uninformative failures.” (Sterelny 2021, 37) Thus, individual learning strategies—whether simple trial-and-error learning or more involved reasoning-processes—might not be productive if the

agent doesn't quickly lock onto something. In contrast, social learning aggregates the insights of individuals acting over several generations.

SL7. More cognitively involved learning methods might not only be inappropriate because of the extra effort but also because they might simply not be conducive to acquiring knowledge by a single individual within their lifetime. Often, learners are so inexperienced and unknowledgeable about whatever they're learning *and* what they're learning is of such complexity that learning by themselves would not be reasonable. There are countless examples of this in the literature. L&A mention how it took *scientists* years to discover what Amerindian groups learned via cumulative culture: How to properly prepare corn by introducing an alkali to dismantle its harmful niacin. Individual reasoning would fail at this. Relatedly, learners acquire information about social norms, conventions, or other ways to behave in joint ventures via social learning. Social norms are often arbitrary, contingent, and causally opaque (Henrich 2015). Because they vary with historical and socio-cultural circumstances, an agent not in the know will be unable to learn about their content by themselves. Likewise, it will be challenging to understand the significance of cultural practices by oneself. Heyes argues that imitation learning's primary function is acquiring the parts of CCK related to such socially normative aspects of social groups (Heyes 2013). That we should often prefer social over asocial learning also explains a vital datum that L&A mention: That models are often dogmatic and actively demand epistemic deference from others. What might seem like bad epistemic dispositions makes sense if seen as a way to bring learners to employ the right learning strategy, i.e., social over individual learning.

Lastly, one might worry that agents who don't make use of their epistemic agency — agents that widely defer — will be all too gullible and taken advantage of by agents seeking to deceive them. And there's something to this observation: Cultural learning, including testimony, is an informational kind of cooperation as information is shared between individuals. And, like all kinds of cooperation, it's, in principle, subject to the threat of defection — models might seek to deceive others for personal gain (Fehr, Fischbacher, and Gächter 2002; Sperber et al. 2010). A social group interested in members having access to CCK thus has an interest or need that this kind of cooperation is stable. Is this the case in cultural learning? In response, note the following:

SL8. The structure of the information networks in social learning being many-to-many lowers the threat of defection: If agents learn from and exchange information with multiple individuals, it becomes more difficult for any particular individual to deceive others (Sterelny 2012, chap. 5).

- SL9. Cultural learning is often an in-group activity. Agents often learn from others who are part of the same epistemic community and have thus a prima facie interest in learners being well-informed, as they'll likely come to both epistemically and practically depend on them.
- SL10. As mentioned, many cultural learning interactions occur in socially structured and scaffolded environments. These environments will be accessible to at least some agents, making cheating and deception much harder. It's more difficult to deceive others about, e.g., the kinds of clothes you're making if they have access to you making them (Sterelny 2012). The fact that lots of tasks and actions are performed in public or semi-public spaces further deters cheating.
- SL11. In observational learning, the model is often unaware that they're being learned from. Clearly, it'd be difficult for me to deceive others if I'm oblivious to whether they're learning from me.
- SL12. Most importantly, social anti-reductionists in the literature on testimony refer to the existence of psychological and social mechanisms that make testimonial interactions knowledge-conducive (or whatever positive epistemic status you prefer) (e.g. Simion 2021; Greco 2020; Graham 2012; Goldberg 2010). These are also at play in cultural learning. For example, social norms regulate social learning interactions in two ways: There are social norms that directly prohibit agents from deceiving others in cultural learning. Other social norms indirectly disincentivise agents from seeking to deceive: In many cultural learning interactions, the learner learns from a model's actions. If the action falls under some social norm, the agent will be incentivised to act successfully (and thus not deceive) irrespective of who learns from them.

In summary, cultural learning is an efficient way to transmit CCK that has specific advantages over individual learning and is a relatively stable form of cooperation.

To be clear, SL1-SL12 don't guarantee that cultural learning is always epistemically productive. After all, there are plenty of examples where the cultural transmission of information is epistemically unsuccessful, as e.g. evidenced in cases of misinformation or conspiracy theories (see, e.g., Levy 2021; Nguyen 2023; Müller 2024). Instead, I propose that SL1-SL12 help explain why CCK-transmission was successful in cases where it is epistemically productive. In these cases, agents taking part in cultural learning interactions should be given credit for promoting their group's epistemic needs. Even if it might seem counter-intuitive, if SL1-SL12 are accurate, then there's a sense that agents are doing what they're supposed to do from the vantage point of their social group. Seeing as agents are so utterly dependent on their social group — both practically and epistemically — acting in ways that promote their group's epistemic functioning and overall welfare

will, at least in most instances, also promote their own epistemic functioning and general welfare. And it's because of this — so my suggestion goes — that they deserve epistemic credit.

#### 4. Knowledge-Transmission and Cultural Learning

Although we'll see that it's not without its problems, John Greco's (2016; 2020) account is a promising candidate to further develop our epistemology of cultural learning. It's proven to be explanatorily powerful when explaining how knowledge is transmitted within social groups via another social learning mechanism: testimony. Here, I'll introduce the account and showcase how it, at least at first sight, fits well with what I've suggested above.

The starting point of Greco's "knowledge economy framework" is the notion of an epistemic community. Epistemic communities are "collection(s) of agents who share some set of information-dependent practical tasks, and who share norms for managing the informational needs associated with those tasks." (Greco 2020, 17)

Greco mentions two needs such epistemic communities might have: First, the need to acquire information relevant to the tasks at hand and second, the need to transmit the information efficiently and securely to the different community members. A central idea of the account is that the norms that govern the epistemic activities of agents should function differently to promote either need. When acquiring information, such norms might have a gatekeeping function — to only allow high-quality information to enter a social group — and thus have strict evidential demands on agents. However, evidential demands could be considerably lower when transmitting information within a social group. So, the promotion of these different needs requires different things from agents. This is reflected in the norms that govern these relevant activities: Sometimes, they'll require the agent to do considerable epistemic work, whilst much less is required in other contexts.

To further characterise knowledge-transmission — the phenomenon we'll focus on in the following — Greco notes the following:

- KTi. For knowledge-transmission to occur, the agent that transmits knowledge must themselves have knowledge;
- KTii. The recipient of the information is relieved from many of the usual burdens they'd have when acquiring information. Put differently, the recipient need not do the usual epistemic work required to come to know that  $p$  — they can depend on the model for it. It is in this sense that knowledge-transmission allows for an epistemic division of labour.
- KTiii. Lastly, the transmission of knowledge is a prerequisite to account for the extent of our knowledge. It's simply the case that the knowledge epistemic communities and their agents

require is too extensive (and complex) for agents to acquire by themselves. So, knowledge needs to be transmitted within social groups.

Greco's view is unique in being anti-reductionist when it comes to knowledge-transmission: An instance of knowledge-transmission doesn't reduce to two instances of knowledge-generation, where knowledge is generated in agent A and then generated anew in agent B.<sup>5</sup> Rather, knowledge-transmission is a distinct way of coming to know something: "One consequence of this is that there really are two ways of "coming to know." That is, there is coming to know for oneself, via some generating source of knowledge, and there is coming to know from someone else, via knowledge transmission." (Greco 2020, 7)

Greco employs an agent-reliabilist, virtue-theoretic outlook to account for knowledge simpliciter and knowledge-transmission, specifically (see Turri, Alfano, and Greco 2021 for an overview of virtue epistemology). On his view, knowledge simpliciter is a success due to competent agency: The agent's competence *explains* why they were successful in attaining knowledge. Importantly, explanatory salience is analysed in qualitative rather than quantitative ways: It's not about how much A contributed to the success, but whether they did so in the right way. Knowledge would be due to an agent's competent agency if that agent contributed to the success in the right way. In turn, what it means for A to contribute "in the right way" depends on the purpose of the activity at hand. For the epistemic case, an agent contributes "in the right way" when they contribute "in a way that would regularly serve relevant informational needs – that is, informational needs within the relevant epistemic community, associated with some relevant domain of action and practical reasoning."(Greco 2020, 97)

A standard objection to epistemic virtue theories is that they're overly individualistic (Turri, Alfano, and Greco 2021). But Greco's view is anti-individualistic in that it conceives of knowledge-transmission specifically as a success due to competent joint agency — it's a joint achievement/success due to two or several parties. The idea is that both the model and the learner cooperate to make the transmission of knowledge successful. In testimony, the speaker shares their knowledge by relaying it to the receiver, whilst the receiver takes up and processes the incoming information. Both agents play their part competently; they act in the right way, given the informational demands of testimonial exchanges within social groups, so that knowledge can be transmitted. Individuals then get epistemic credit by being part of a successful joint or collective action or, more precisely, by acting in the right way within that joint action.

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<sup>5</sup> Greco's transmission anti-reductionism should be distinguished from the question of whether testimony is its own species of knowledge or whether it can be reduced to familiar generative sources, such as perceptual or inductive knowledge. Here Greco advocates for a reductionist position, i.e. that testimony can be reduced to other sources (Greco 2020). I remain neutral on this question.

Notice how Greco’s framework nicely matches what I suggested above, in that agents deserve credit for promoting their communities’ epistemic needs. The basic idea then is this: Cultural learning should be seen as a kind of knowledge-transmission in the Greconian sense: Knowledge already within the social group is transmitted amongst its members. Viewed in this way, we can see how agents might be deserving of credit for their epistemic behaviour in cultural learning: Both the model and learner contribute jointly to the success in the right way. The success in question is the transmission of CCK from models to learners. And agents are acting “in the right way” because — as argued in SL1-SL12 — they’re promoting their epistemic community’s transmission-related needs.

Greco’s framework would thus allow us to account for the transmission of CCK via social learning. This would further the account’s already considerable explanatory power and general attractiveness. On reflection, however, we can see substantial problems with this proposal. Discussing this will allow us to develop the epistemology of CCK and cultural learning in more detail.

### **5. Knowledge-transmission and non-testimonial cultural learning**

The issues with Greco’s account as it relates to CCK-transmission are due to its strong focus on testimony. Greco takes testimony as *the* paradigmatic instance of knowledge-transmission and models his account of the latter in its light.<sup>6</sup> This is problematic insofar as — as we saw in section 2A — cultural learning is made up of a variety of different strategies: Selective social learning, hybrid learning, observational learning (in particular imitation), explicit teaching and many others. While testimony is certainly one mechanism employed in cultural learning generally and in explicit teaching specifically, the variety of mechanisms we see in cultural learning makes the claim that testimony is the paradigmatic instance of knowledge-transmission appear doubtful (see also McMyler 2022b).

As I’ll argue below, the framework’s being centred around testimony gives rise to two distinct problems:

- A. Not all instances of knowledge-transmission involve epistemically depending on others.
- B. Even if it does, knowledge-transmission doesn’t necessarily involve a shared intention to share knowledge.

#### A. Knowledge-Transmission and Epistemic Dependence

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<sup>6</sup> Greco does concede in a footnote that there might be non-testimonial ways of transmitting knowledge (Greco 2020, 68, footnote 1). This doesn’t seem to impact neither his understanding of testimony being the central case of knowledge-transmission nor his account of the latter (see below).

Recall Greco's anti-reductionism regarding knowledge-transmission. On his view, there are two fundamental and distinct ways of coming to know: For oneself (knowledge-generation) and from someone else (knowledge-transmission). In knowledge-transmission, KT*i*) the model knows, KT*ii*) the learner depends on them for said knowledge, and KT*iii*) these sorts of mechanisms are supposed to be a prerequisite to explain the extent of our knowledge.

The issue is that certain cultural learning strategies don't seem to fit this description. These will be cases where agents come to know i) via cultural learning and ii) by seeing or figuring out things for themselves. McMyler (2022b) notes that testimony is only one of several strategies we employ in explicit teaching. Students are also confronted with arguments, problem sets, exercises, and explanations. These strategies often don't aim at students unquestioningly accepting the instructor's assertions or, more generally, epistemically depending on them. Instead, students are supposed to come to see or figure things out for themselves.

Another example is hybrid-learning, where agents learn individually in socially scaffolded and structured environments. Consequently, it's plausible that these strategies will have gradual differences regarding how much learners depend on others — e.g., in the testimony cases that Greco describes — and the degree to which they attain knowledge by seeing things for themselves. There aren't two fundamentally different ways of coming to know, as Greco would have it, but rather a multitude of different ways that differ gradually regarding how knowledge is attained interdependently or individually (McMyler 2022b).

Importantly, it still seems apt to subsume these cultural learning strategies under the label of knowledge-transmission. After all, from the social group's perspective, knowledge already within the group is being transmitted. The same need as in testimony is being addressed here — to efficiently and safely transmit information within social groups. What differs is how this is done. Put differently, the epistemic function of these strategies and mechanisms is the same: They function to transmit CCK. But how that function is fulfilled differs between strategies: Some strategies lead to agents acquiring CCK by seeing things for themselves, whereas other agents come to attain it in dependence of others.

An interesting question arises at this point: Why is it that we see these different varieties of knowledge-transmission? I take it the answer to this question will reference various factors, some of which we've already touched upon in SL1-SL12:

- Complexity: The complexity of learning contents will likely correlate with how socially involved cultural learning strategies are. In other words, the farther away from an agent's ZLS learning contents are, the more investment by other agents will be necessary to transmit CCK. The reason we have explicit teaching — a very resource-intensive activity — is that it's simply required, given the complexity of what's being taught.

- Efficiency: From the perspective of the social group, it's optimal that learners opt for the least resource-intensive learning strategy, as this frees up other agents (and the learners themselves) to be productive in different ways.

Plausibly, which strategy agents are to choose is impacted not just by the complexity of the trait but also by factors specific to the agent (how talented are they?), their community (how much resources can they expand for teaching?), and their environment (what CCK does it require the agent to have?).

Besides these practical factors, a more genuinely epistemic consideration also likely plays its part: Different cultural learning strategies will be conducive to acquiring different epistemic goods. In particular, whilst those strategies that have learners depend on others might be sufficient to acquire CCK, they might not be sufficient to gain understanding. For this, agents need to come to see or grasp things for themselves. Greco mainly focuses on the need to transmit knowledge within social groups. However, it seems plausible that social groups have broader epistemic needs when it comes to transmitting information within them. To see this, consider that agents who understand are able to do certain things with the information they've acquired that agents who know by relying on others aren't able to: They're able to apply it in different circumstances, draw novel inferences, and manipulate the relevant information to suit their specific needs (see, e.g., Hills 2016; Elgin 1999; De Regt 2017). Understanding cultural information and traits will allow agents that inhabit fast-changing environments (e.g., the internet) or have needs that are specific to them to employ that information gainfully. For example, recall the examples of cumulative culture from the beginning of this article: The moon landing and Inuit clothing. It might be sufficient for astronauts to depend on others for their knowledge that the rocket that brings them to space will work. But when it comes to the work they're to do in space — let's say repair some part of the international space station — this might require them to genuinely understand certain aspects of it, as on-the-fly modifications of technique might be required. Likewise, with Inuit clothing, it might be sufficient to depend on others for knowledge about how the caribou skin is to be processed. However, how certain leather pieces are to be stitched together requires genuine understanding, as learners might need to repair them in unexpected circumstances.

In summary, knowledge-transmission encompasses a variety of different strategies and mechanisms. Some lead to agents acquiring CCK in dependence of others, others lead to agents seeing things for themselves to acquire CCK, but plausibly also understanding.

#### B. Not all knowledge-transmission involves joint intentions to share knowledge

Another issue with Greco's knowledge-transmission framework is this: Even when the transmission of CCK *does* involve epistemically depending on others, agents aren't required to share

intentions to share knowledge. Here, I'll introduce a case of cultural learning without shared intentions to share knowledge and argue that it nonetheless should be categorised as knowledge-transmission.

To see this, we need to consider Greco's account of testimony and how this impacts his account of knowledge-transmission. He understands testimony to be a kind of speech act — telling — that centrally involves both the intention of the speaker to share knowledge and, for the speech act to be successful, the hearer's recognising and understanding this intention. In light of this, Greco conceives of knowledge-transmission (by testimony) as a joint action, i) where agents share the intention to F, ii) where the joint action is interactive so that what A does depends on what B does and vice-versa and iii) where the contribution of both agents is required for the success of the action. What results is the following account of knowledge-transmission:

*“(KT) Knowledge that  $p$  is transmitted from a speaker  $S$  to a hearer  $H$  just in case  $S$  successfully tells  $H$  that  $p$ .*

*And that happens just in case: (1)  $S$  knows that  $p$ ; (2)  $S$  asserts that  $p$  with the intention of sharing knowledge that  $p$  with  $H$ ; (3)  $H$  understands and shares  $S$ 's intention; (4)  $S$  and  $H$  act jointly so as to bring about their shared intention.” (Greco 2020, 57)*

Again, whilst this account might be accurate for some instances of cultural learning, it won't be in others. For example, consider this case where the learner acquires CCK via observational-learning and in dependence of others:

*[XANDOR&ROMY] Xandor is a novice in making clothing — he knows nothing about the materials used, the stitching process, or how measurements should be taken. He couldn't learn how to do so independently, as this would require cultural skills, techniques, and knowledge that have been refined over generations and are outside of his ZLS. Romy is an expert clothes-maker. Xandor observes Romy making that particular piece of clothing. Romy is unaware that this is the case. Xandor watches Romy and thus comes to know that to make this piece of clothing, he needs to use a particular stitching technique, treat the material in a certain way, and use a particular piece of cloth at a specific junction of the process.*

Let me briefly mention two things before discussing whether XANDOR&ROMY meets Greco's characterisation of knowledge-transmission (KTi-KTiii):

First, as mentioned in section 2A, by acquiring CCK from Romy via observational learning, Xandor doesn't only come to acquire propositional knowledge, but plausibly also knowledge-how, and

perhaps even tacit knowledge. Still, Xandor *also* acquires some propositional knowledge: that to make a piece of clothing, he needs to do x, y, and z. He'd, for example, be able to answer factual questions about the clothes-making process. *Causally*, different mechanisms might lead to this kind of knowledge. For instance, Xandor might infer from his observations of Romy that he must go through these steps to make a piece of clothing. Or, as Tanesini (2022) notes, his propositional knowledge might arise from possessing the relevant skill. What's essential to our discussion is that, *epistemically*, Xandor's beliefs are knowledgeable because they're based on Romy's. I'll say more about how Xandor's beliefs depend on Romy below.

Second, and perhaps more importantly, Xandor and Romy can't be said to share the intention of sharing knowledge, as Romy is unaware of Xandor's cultural learning efforts. Whilst idealised, XANDOR&ROMY isn't a highly fabricated case: As we saw above, lots of cultural learning mechanisms are designed to be efficient and not require investment on part of the model. So, we should expect that agents not sharing the intention to share CCK is prevalent in real-world cases of non-testimonial cultural learning.

What should we make of this difference then? Greco offers us this when discussing his definition of knowledge-transmission: "The reason that some such characterisation is needed is to distinguish knowledge transmission from other ways that one might come to know via testimony." (Greco 2020, 58) — where "some such characterization" refers to the shared intention to share knowledge, and the alluded "other ways" refer to ways one might come to know that don't qualify as knowledge-transmission. This is relevant to our aims here since the lack of the knowledge-intention in cultural learning might indicate that agents gain knowledge in these interactions but not in ways that instantiate knowledge-transmission.

Greco discusses two kinds of cases where the shared intention to share knowledge is absent and where knowledge isn't transmitted:

1. He discusses cases where the recipient comes to know that p via someone else's testimony but not because of the contents of said testimony. The recipient might thus learn that p but does not learn from the words uttered that p. For example, A might learn that B has an alto-voice if B sings, "I have an alto-voice". But here, A would learn from the contents of B's testimony, but rather by means of having perceived the pitch of B's voice. A's knowledge here isn't due to B's testimony but due to A's own perceptive capacities (Lackey 2008).
2. Greco mentions cases where the information-recipient does learn from another's words, but knowledge nonetheless isn't transmitted. Speakers don't intend to share knowledge in these cases, but the hearer nevertheless acquires it. He discusses Anscombe's mistaken liar

example and a case where a police officer deduces who committed a crime based on the testimony of an uncooperative witness.

I agree that in these cases, knowledge isn't transmitted. But my diagnosis of why that is slightly differs from Greco's: I take it that knowledge isn't being transmitted in these cases primarily because one agent did not or could not depend on another epistemically. In the first case above, the hearer comes to know that  $p$  based on their own perceptual abilities and not by depending on the speaker, even though they presumably could have done so. In case 2, the hearer cannot depend on the speaker and must thus do the required epistemic work by themselves.

There's more to say about Greco's reasons for focusing on the intention to share knowledge. But for reasons of space, my strategy here will be to make the case that it's independently plausible that observational learning as described in XANDOR&ROMY — although there are no shared intentions to share knowledge — does qualify as knowledge-transmission, as Greco has characterised it (KT<sub>i</sub>-KT<sub>iii</sub>): The model (Romy) knows (KT<sub>i</sub>), the learner (Xandor) can depend on the model (Romy) for said knowledge (KT<sub>ii</sub>), and these kinds of interactions are necessary to account for the extent of our knowledge (KT<sub>iii</sub>). Let me go through these in more detail:

Regarding KT<sub>i</sub>: Being an expert clothes-maker, it seems clear that Romy has the relevant knowledge about clothesmaking — this is just what being an expert entails. Clothes-making is itself a cultural trait, one that's been refined over generations. As such, Romy has likely acquired her knowledge through the cultural learning mechanisms discussed above. But this shouldn't hinder us from ascribing knowledge to her in this case: If what I said above is correct, culturally learning from others is a legitimate way of acquiring knowledge. Moreover, for the case above to work out, we could also just stipulate that Romy is some sort of genius clothes-maker who's come up with a new method by studying past designs and reasoning her way towards improving them.

I take KT<sub>iii</sub>) to be similarly uncontroversial: It's widely accepted that observational learning is a prerequisite to account for the extent of our CCK (see e.g. Sterelny 2012; Henrich 2015). Thus, the bone of contention lies with KT<sub>ii</sub> and whether observational learning qualifies as an instance of epistemic dependence.

Here's what the notion of epistemic dependence (roughly) amounts to (see e.g. Broncano-Berrocal and Vega-Encabo 2020; Pritchard 2021; Goldberg 2011; Hardwig 1985; Greco forthcoming): Epistemic dependence is often taken to be agential notion<sup>7</sup>, such that an agent A depends on an

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<sup>7</sup> It's controversial whether epistemic dependence necessarily is an agential notion, as agents sometimes also depend on their epistemic communities' social practices and structures or, more generally, on features of their epistemic environment (see, e.g., Goldberg 2020; Tanesini 2022). Below I suggest that in CCK-transmission, agents do indeed depend on the social practices of their epistemic communities. As far as our main question is concerned — whether and when agents deserve credit for CCK-transmission — an agential notion of dependence does seem most helpful, as agents depend on those responsible for maintaining the relevant social practices. I concede, however, that there

agent B (or the epistemic standing of the respective belief (e.g., that their belief is knowledgeable, justified, or warranted) to attain an epistemic goal. Beyond this, we can note that:

ED1. Epistemic dependence is something over and above mere causal dependence (see, e.g., Hawley 2010).

ED2. In epistemic dependence, the epistemic properties of the learner's belief (partly) supervene on the epistemic properties of the model's belief or other factors outside of the learner's cognitive agency (see, e.g., Goldberg 2010; Pritchard 2015).

ED3. Greco (forthcoming) argues for epistemic dependence to be vulnerable: In epistemic dependence, the learner's epistemic properties do not supervene on their knowledge or justification that the model has the properties in question.

And here's why observational learning qualifies as epistemic dependence so conceived:

Concerning ED1, learners often don't *just* causally depend on models for their knowledge but do so epistemically. To be clear, it is possible that Xandor simply depends on Romy to acquire the information that *p*, but the relevant epistemic property comes from whatever Xandor himself does with the information. After making this piece of clothing, in the way Romy demonstrated several times, Xandor might come to see for himself that this is a reliable way of doing so. Plausibly, some social learning interactions — e.g., observational or hybrid learning — work in this way. But we can stipulate that this isn't the case, that Xandor simply observes Romy, imitates what she does, and thereby comes to believe that *p*. Here, Xandor doesn't see for himself why a particular technique was used, which step needs to come before another etc. But it still seems to be a way in which he can come to know about these things. The dependence isn't causal but epistemic.

Regarding ED2, the justification (or other epistemic properties) of Xandor's beliefs isn't due to his own epistemic agency. It's in virtue of Romy's expertise that his beliefs are of a certain epistemic standing. To see this, consider that much like a hearer's belief isn't knowledgeable because they've perceived that *p* through somebody else's testimony, but due to the epistemic standing of the testifier, the reason why Xandor's belief is knowledgeable also isn't due to his perceiving that *p*, but due to Romy's expertise. If Romy weren't an expert clothes-maker yet produced something that by accident looks the part, Xandor would still come to believe that *p*. This shows that the standing of Xandor's beliefs co-vary with Romy's: His beliefs are false and unjustified, just as her beliefs are. It also indicates that Xandor's beliefs aren't truly sensitive to the reasons that might ground his belief: Reasons pertaining to how functional clothes are made in particular environments. For this, he's seeking to rely on Romy.

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might be non-agential epistemic dependence, e.g., dependence on cultural selection mechanisms or scaffolds (Tanesini 2022). I'll revisit this topic when concluding.

Regarding ED3, the epistemic properties of Xandor's beliefs don't depend on his knowing or having justified beliefs about Romy's expertise. They simply depend on Romy's expertise. To see this, imagine Xandor as a small child, unaware of who has expertise and who lacks it. If Xandor learns from Romy, he does acquire knowledge about clothes-making by virtue of learning from an expert.

In summary, then, I argued that Greco's focus on testimony has distorted our view of how the transmission of CCK functions. Not only don't all instances of knowledge-transmission involve agents depending on others, but even if they do, they don't necessarily involve shared intentions to share knowledge.

## **6. Intentions and epistemic credit in the transmission of CCK**

The insights from the previous section inform our account of when agents deserve epistemic credit in cultural learning. An amended version of Greco's view still posits that agents deserve credit for transmitting CCK when they act in the right way — in ways that promote their communities' needs to safely and efficiently transmit CCK. But it acknowledges that this can happen via various mechanisms — testimonial and non-testimonial cultural learning — and that different mechanisms will differ in how they'll fulfil this need — at times, this will involve epistemic dependence and shared intentions to share CCK; at other times, it won't. Here, I'll go into more detail about why agents deserve credit in cultural learning: Learners for employing the right kinds of learning strategies and both learners and models for partaking in the kinds of social practices that allow for the transmission of CCK.

As far as credit is concerned, then, cases where CCK is transmitted such that the learner comes to see things for themselves can be accommodated relatively straightforwardly: All the credit goes to the learner.<sup>8</sup> Cases where the learner depends on others are more complicated, however.

Let's consider how this plays out in XANDOR&ROMY. Why does Xandor — the learner — deserve credit in cases of observational-learning? As we saw in section 2, it appears doubtful whether Xandor would deserve credit on standard views, as he's overly deferential, incurious, and over-imitates to an irrational degree. We can now see Xandor does deserve credit: He's not only sensitive to whom he should learn from, and when he should do so, he more generally employs cultural learning mechanisms that promote his social group's needs to safely and efficiently transmit CCK. As detailed in SL1-SL14, observational learning is an unobtrusive mechanism that requires only few resources from the group overall. In turn, models are freed from having to teach and can

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<sup>8</sup> I'm sceptical that there truly are cases where learners come to acquire new CCK in ways completely independent of others. For example, even in the cases discussed above, where students come to see things for themselves based on the exercises provided by their teachers, one might still think that they're dependent on their teachers to provide them with the right kinds of exercises, or more generally on the school for providing the right kind of learning environment.

be otherwise productive (e.g., by producing clothing). Observational-learning is thus ideal in cases where learning contents aren't so complex that they need detailed instruction. At times, agents will need to understand what they learn about. This would mean Xandor would have to acquire CCK by seeing things for himself to deserve credit. But at other times, simple knowledge will do. And in these cases — cases like XANDOR&ROMY — this will mean that acquiring CCK via depending on others will suffice for Xandor to deserve credit. In either case, Xandor would deserve credit for employing these mechanisms in the right way.

One might wonder whether Xandor's acquiring CCK about clothes-making isn't accidental. After all, as with all cultural traits, how clothing is being made in Xandor's group is the outcome of a process of generational improvement on that trait. Xandor — and likely Romy as well — are ignorant of this process. So why isn't it accidental that Xandor acquires the right cultural traits — i.e., the most optimal way of making clothing accessible to his group? The reason for this is twofold: First, in being guided by mechanisms that tell Xandor whom to learn from — what's called selective social learning (see, e.g., Henrich 2015) — Xandor himself is to be credited with seeking out the kinds of agents to whom he can defer. In our case, Xandor was sensitive to Romy's being an expert and thus acquired CCK from her over others. Second, and perhaps more importantly, Xandor's group and learning environment are structured in ways conducive to acquiring the relevant cultural traits. For example, his group will be structured by social norms that will identify the relevant experts, such as Romy, and make them accessible to Xandor. Xandor's social group will also have cultural institutions — such as the apprentice-learning system (Sterelny 2012) or schools — that'll allow him to acquire the relevant traits. As such, credit for CCK-transmission goes beyond Xandor — to the institutions and the agents responsible for the structure and scaffolding of Xandor's learning environment.

This insight — that knowledge-transmission is essentially dependent on institutions and agents that structure and scaffold the epistemic environment — is also relevant to how credit accrues not only to the learner, but also to the model. I'll first discuss the implications for credit to the model and will revisit how additional credit accrues to the learner afterwards.

To see why this isn't necessarily straightforward, consider that it's a tenet of virtue epistemology that agents deserve credit in virtue of their intentions and how they go about promoting them (see, e.g., Palermos 2020; Turri, Alfano, and Greco 2021). In several cultural learning cases, e.g., in cases of active teaching, the model will deserve credit in virtue of sharing the intention of sharing knowledge with the learner, as Greco envisages. But in XANDOR&ROMY, Romy lacks the intention of sharing CCK with Xandor. So, should we want to give her credit in this case?

We can distinguish between, on the one hand, a model deserving credit for intending to share knowledge — and thereby deserving credit for transmitting knowledge between agents — and, on

the other hand, their deserving credit for having knowledge and intending to act based on it. In social learning interactions, models *certainly* deserve credit in virtue of the latter: They've done the epistemic work to acquire the relevant beliefs and intend to act in light of them.

But there's the question of whether models also deserve credit for knowledge having been transmitted between agents. Here's why I think they do: Romy might not deserve credit for actively intending to share CCK with Xandor. But, importantly, she does more than solely act based on her knowledge. In particular, she deserves credit for partaking in and upholding group-wide social practices that allow for the transmission of CCK.

What social practices am I speaking of here? As we learned above, cultural learning interactions occur in socially structured and scaffolded environments. For example, social groups are structured by norms that guide agents in their learning efforts (e.g., whom they should learn from) but also instruct models in how they should teach learners or to perform certain actions in public, or at least in places accessible to members of (perhaps a subset) of their social group (think again of the apprentice-learning system, where apprentices have access to and can learn from experts in their learning environments (Sterelny 2012)).

To see how this might work out for cases like XANDOR&ROMY, consider that the agents of their group might have a — perhaps tacit — agreement to perform certain kinds of actions, such as clothes-making, in public. As mentioned in SL10, this has the upshot of making it more difficult for models to deceive others about their actions. But it also has the benefit of allowing others to observe and gain knowledge from models.

These kinds of social practices are essential to the transmission of knowledge. Intuitively, this speaks in favour of the agents that uphold them to be worthy of credit. But, in which sense are agents like Romy acting in the right way, i.e., promoting their groups' epistemic needs and thus deserving of credit when they participate in these kinds of social practices?

The way I see things, individuals share the credit/blame for any particular social practice being present within their communities (see Millar 2021). Social practices require a collective of individuals to act in coordinated ways to be upheld or changed. Because these social practices are essential to the group's epistemic functioning and overall wellbeing, individuals have a *shared obligation* to uphold (productive) socio-epistemic practices — and are deserving of credit/blame in light of this. So, each individual gets credit for “playing their part” so that the particular social practices are (not) being upheld and their groups' epistemic needs are promoted in this way. Of course, different individuals might deserve credit to different degrees depending on their role in upholding or changing the respective social practices — e.g., influential individuals might deserve more credit/blame than others. But all individuals partaking in the collective action receive — perhaps only small amounts of — credit in virtue of their contribution to the collective action

and the goods that are attained in virtue of it. In these sorts of cases, playing one's part, i.e. fulfilling one's (mutual) obligation, so that a socio-epistemic practice is being upheld amounts to acting in the right way, i.e., in ways such that the needs of their communities — the safe and efficient transmission of CCK — is being fulfilled.

Importantly, ascribing credit to collectives of agents is different from ascribing credit to a social group as such: On my view, rather than the credit going to the group as a whole, each individual accrues credit and/or blame in virtue of (not) contributing their part so that epistemically productive social practices regulate their groups.<sup>9</sup> The overall picture here is that knowledge is a deeply social phenomenon. Correspondingly, the credit for its attainment and transmission is spread far.

In XANDOR&ROMY, Romy — and other agents like her<sup>10</sup> — all individually deserve credit for playing their part so that productive social practices are being upheld. In this case, to act in the right way just is to play one's part in a wider social system that allows for CCK to be transmitted, and it's in virtue of this that Romy — and the other agents that support this system — deserve credit. As mentioned above, different agents will deserve different amounts of credit given their role in upholding the relevant social practice in any given instance. And so, in XANDOR&ROMY, it seems that Romy is perhaps more deserving of credit than others, as she is an expert, and her acting on her expertise plays a pivotal role in CCK being transmitted to Xandor.

What then is required of Romy and agents like her to partake in the relevant social practice and thus act in the right way? It seems that simply acting based on their knowledge isn't sufficient here, as they could do so without any regard for the social practices at play. Thus, simply having knowledge and acting based on it seems insufficient to gain credit for knowledge being transmitted. What's additionally required is an awareness or appreciation of these social practices and their role within them. I propose that such an awareness of these social practices need not be very demanding and can manifest itself when agents act in ways that are counterfactually responsive to the requirements of these social practices.<sup>11, 12</sup> We can modify the original XANDOR&ROMY case

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<sup>9</sup> This isn't to say that there might not be other reasons for ascribing credits to groups, rather than collectives of individual agents in cases of CCK-transmission — this might well be the case. But my question here is how models deserve credit in CCK-transmission, and thus the focus differs.

<sup>10</sup> This likely also includes agents from generations past, as social practices are themselves cultural traits: They emerge, change, and stabilise over multiple generations. Thus the credit for knowledge-conducive social practices likely is to be spread over several generations of individuals.

<sup>11</sup> Responsiveness, roughly speaking, comprises not only sensitivity to existing social practices but also the ability to be guided by the requirements of social practices in action and thought (see, e.g., Meylan 2017).

<sup>12</sup> There are of course several more interesting questions that we may ask with regards to how agents should interact epistemically with social practices. For example, how should agents engage with social practices that are unjust or unproductive? Here, it would seem like mere responsiveness to their requirements is insufficient. These questions go beyond the scope of this article and are thus best addressed in future research (but see, e.g., Sertler 2022; Toole 2019; Dotson 2014; Müller 2024)

slightly to illustrate such responsiveness: If whatever action Romy was performing wasn't to be performed such that others could learn from her doing so — say because it's dangerous and/or requires closer supervision — we can stipulate that she wouldn't have performed said action in such a public manner. But if she did, we would be justified in blaming her for doing so and for knowledge being transmitted when it shouldn't have been. Crucially, the existence of blame goes hand in hand with the attribution of credit: It'd be odd to blame someone for something they wouldn't deserve credit for (see, e.g., Boulton (2021) for an overview of epistemic blame).

Importantly, this kind of responsiveness to social practices doesn't require Romy to intend to act for the reasons why the social practice was established, i.e. so that CCK can be shared within her group. Awareness of the reasons for social practices would plausibly require too much of agents in many cases. This is because many social practices are the product of somewhat arbitrary and contingent historical processes and regulate complex and causally opaque behaviours (see, e.g., Sterelny 2021). Why one should conform to them is thus not easily knowable to agents. Consider the norms of friendliness: I don't need to understand why greeting others in a particular fashion is considered apt. However, I do need to be responsive to what the norms of greeting require of me. Something similar holds for social norms with epistemic import, like "Respect your elders" or "Be loyal to your friends". When and why one should conform to these norms is a contextual and complex matter (see Müller 2024). Likewise, Romy doesn't need to understand why she's required to make her clothes in publicly accessible spaces — but she needs to be responsive to what the relevant social practices demand of her.

This view also allows us to capture that Romy's intentions are epistemically relevant in that they need to be responsive to the requirements of the respective social practices. For example, if Romy had intended to deceive Xandor, she'd also be blameworthy on the above account. This is because Romy would be violating the requirements of her group's social practices, i.e., how information is transmitted within the group, as these would prohibit deception. So, in this case, her intentions precisely wouldn't be responsive to what's required of her.

In summary, then, models deserve credit for acting in the right way. In cases such as XANDOR&ROMY, this amounts to models acting knowledgeably and fulfilling their mutual obligations to uphold the kinds of socio-epistemic practices that allow for the transmission of CCK — where this just is to be responsive to the requirements of these practices.

This view has two further upsides: First, it informs how credit accrues to the learner in cases such as XANDOR&ROMY. After all, learners also need to play their part for these practices to be successful. To see this, consider that the successful transmission of CCK isn't solely due to the existence of a structured and scaffolded learning environment but is also due to the learners

responding appropriately to such an environment: Learners also play their part so that CCK can be transmitted in these cases. And they do so by being responsive to what these kinds of social practices, and the epistemic environments that result from them, require of them. Sometimes, this will mean that learners employ mechanisms and strategies such that they come to see things for themselves. In other cases, those similar to XANDOR&ROMY, agents are supposed to employ mechanisms and strategies that allow them to depend on others. This allows us to see that learners too contribute to the success of the kinds of social practices that allow for the transmission of CCK by being responsive to their requirements. Learners thus also act in the right way by playing their part, e.g., by being responsive to the question of which cultural learning strategy they're to employ. This also has interesting implications for debates on testimony. Ever since Lackey (2008), it seemed that hearers in testimonial interactions where they simply take another word for it aren't deserving of credit, as they presumably do very little. What my view suggests is that, whilst credit does indeed spread beyond the learner/hearer, there is credit to be ascribed to them as well. Learner/hearers are responsive to the requirements of the social practices that allow for the transmission of CCK. They act in the right way by correctly employ the right kind of social learning mechanism for a given context. Future work should address the implications for debates on testimony in more detail. Second, the view also allows us to appreciate how both models and learners participate in the collective action of knowledge-transmission as Greco envisages. Knowledge-transmission in the case of social learning *is* a success due to the collective action of several parties. However, this doesn't require agents to actively intend to share their knowledge with another agent. Rather, it requires that agents are counterfactually responsive to the requirements of the social practices that regulate the transmission of CCK. When this is the case, these agents are playing their part so that CCK can be transmitted and, in doing so, they act in the right way so that the epistemic needs of their communities are met. As such, they're deserving of credit.

## **7. Conclusion**

CCK and cultural learning are of crucial importance to our way of life, yet they have only been given little attention by present-day epistemologists. Here, I focused on how we should evaluate individual epistemic conduct in employing cultural learning mechanisms to acquire CCK. In particular, I asked whether and when they'd deserve credit for doing so. There's reason to believe that extant accounts would struggle to accommodate how this happens, as the exchange of information in cultural learning is seldom dyadic and neither a purely individual- nor a purely group-level affair. Additionally, many standard accounts would judge that agents' cultural learning behaviours are vicious rather than virtuous or to be credited despite their success in acquiring CCK.

I showed why cultural learning is epistemically sensible, as it promotes an aim that most social groups will share: The safe and efficient transmission of CCK. I further proposed that there was, at least at first sight, a good fit between my observations and Greco's knowledge-transmission framework. On closer look, however, we were able to spot some issues with this account due to its being centred on cases of testimony. First, not all instances of knowledge-transmission involve agents depending on others — sometimes, they lead to agents seeing things for themselves. This is likely not only due to reasons of complexity and efficiency but also due to cultural learning promoting epistemic values other than knowledge, in particular understanding. Second, even if knowledge-transmission does involve epistemic dependence, it doesn't involve agents sharing the intention to share knowledge. This has implications for credit: On the picture I propose, learners and models deserve credit for being responsive to the requirement of the social practices that allow for the transmission of CCK.

There is, of course, lots that is left to do: Future work should address the notion of CCK in more detail, as it still is rather broad and vague. We should also consider whether practical knowledge is transmitted differently than propositional knowledge and whether there are differences in how credit is to be ascribed in virtue of this.

Relatedly, we've seen that cultural learning consists of various mechanisms. Whilst they all promote the function of efficient and safe CCK-transmission, we might want to ask not only how these mechanisms precisely fulfil this function but also under which conditions they do so best and whether agents are differently creditworthy for employing, e.g., a mechanism by which they attain CCK by coming to see for themselves over one where they attain it via deference.

I've also highlighted how cultural learning is an efficient and relatively stable form of cooperation, in part because of the existence of social practices and norms. But like other social practices, social *epistemic* practices are subject to distortion that might prohibit the transmission of CCK — as discussed in research on misinformation and conspiracy-theories (see, e.g., Levy 2021; Nguyen 2023; Müller 2024). Future research should more carefully consider the conditions under which social practices are epistemically (un-)productive.

Lastly, L&A argue that next to individuals and groups, cultural selection mechanisms deserve credit for influencing which cultural traits we find in which groups and Tanesini (2022) draws attention to the role of scaffolds. As I've focused on how individuals deserve credit for their cultural learning efforts, these factors haven't been considered. As such, the above is but the start of a much larger project.

## References

Bandini, Elisa, Jonathan Scott Reeves, William Daniel Snyder, and Claudio Tennie. 2021.

- ‘Clarifying Misconceptions of the Zone of Latent Solutions Hypothesis: A Response to Haidle and Schlaudt’. *Biological Theory* 16 (2): 76–82. <https://doi.org/10.1007/s13752-021-00374-x>.
- Battaly, Heather. 2022. ‘Access Denied: Epistemic Obstruction and the Distribution of Knowledge’. *Synthese* 201 (1): 6. <https://doi.org/10.1007/s11229-022-04007-z>.
- Boult, Cameron. 2021. ‘Epistemic Blame’. *Philosophy Compass* 16 (8): e12762. <https://doi.org/10.1111/phc3.12762>.
- Broncano-Berrocal, Fernando, and Jesús Vega-Encabo. 2020. ‘A Taxonomy of Types of Epistemic Dependence: Introduction to the Synthese Special Issue on Epistemic Dependence’. *Synthese* 197 (7): 2745–63. <https://doi.org/10.1007/s11229-019-02233-6>.
- De Regt, Henk W. 2017. *Understanding Scientific Understanding*. Oxford University Press. <https://doi.org/10.1093/oso/9780190652913.001.0001>.
- Dean, Lewis G., Gill L. Vale, Kevin N. Laland, Emma Flynn, and Rachel L. Kendal. 2014. ‘Human Cumulative Culture: A Comparative Perspective’. *Biological Reviews* 89 (2): 284–301. <https://doi.org/10.1111/brv.12053>.
- Dotson, Kristie. 2014. ‘Conceptualizing Epistemic Oppression’. *Social Epistemology* 28 (2): 115–38. <https://doi.org/10.1080/02691728.2013.782585>.
- Elgin, Catherine Z. 1999. *Considered Judgment*. Princeton University Press.
- Fehr, Ernst, Urs Fischbacher, and Simon Gächter. 2002. ‘Strong Reciprocity, Human Cooperation, and the Enforcement of Social Norms’. *Human Nature* 13 (1): 1–25. <https://doi.org/10.1007/s12110-002-1012-7>.
- Goldberg, Sanford C. 2010. *Relying on Others: An Essay in Epistemology*. Oxford: Oxford University Press.
- . 2011. ‘The Division of Epistemic Labor’. *Episteme* 8 (1): 112–25. <https://doi.org/10.3366/epi.2011.0010>.
- . 2020. ‘Epistemically Engineered Environments’. *Synthese* 197 (7): 2783–2802. <https://doi.org/10.1007/s11229-017-1413-0>.
- Graham, Peter. 2012. ‘Testimony, Trust, and Social Norms’. *Abstracta Special Issues* 6 (3): 92–116.
- Greco, John. 2016. ‘WHAT IS TRANSMISSION\*?’ *Episteme* 13 (4): 481–98. <https://doi.org/10.1017/epi.2016.25>.
- . 2020. *The Transmission of Knowledge*. Cambridge University Press.
- . forthcoming. ‘Social Epistemic Dependence’. *Philosophical Topics*.
- Hardwig, John. 1985. ‘Epistemic Dependence’. *Journal of Philosophy* 82 (7): 335–49. <https://doi.org/jphil198582747>.
- Hawley, Katherine. 2010. ‘Testimony and Knowing How’. *Studies in History and Philosophy of Science Part A, Explanation, inference, testimony, and truth: Essays dedicated to the memory of Peter*

- Lipton, 41 (4): 397–404. <https://doi.org/10.1016/j.shpsa.2010.10.005>.
- Henrich, Joseph. 2015. *The Secret of Our Success*. Princeton University Press.
- Heyes, Cecilia. 2013. ‘17 What Can Imitation Do for Cooperation?’ *Cooperation and Its Evolution*, 313.
- . 2018. *Cognitive Gadgets*. Harvard University Press.
- . 2021. ‘Imitation and Culture: What Gives?’ *Mind & Language* n/a (n/a). <https://doi.org/10.1111/mila.12388>.
- Hill, Kim R., Brian M. Wood, Jacopo Baggio, A. Magdalena Hurtado, and Robert T. Boyd. 2014. ‘Hunter-Gatherer Inter-Band Interaction Rates: Implications for Cumulative Culture’. *PLOS ONE* 9 (7): e102806. <https://doi.org/10.1371/journal.pone.0102806>.
- Hills, Alison. 2016. ‘Understanding Why’. *Noûs* 50 (4): 661–88.
- Hoehl, Stefanie, Stefanie Keupp, Hanna Schleihauf, Nicola McGuigan, David Buttelmann, and Andrew Whiten. 2019. ‘“Over-Imitation”: A Review and Appraisal of a Decade of Research’. *Developmental Review* 51 (March): 90–108. <https://doi.org/10.1016/j.dr.2018.12.002>.
- Hoppitt, William, and Kevin N. Laland. 2013. *Social Learning: An Introduction to Mechanisms, Methods, and Models*. Princeton University Press. <https://doi.org/10.1515/9781400846504>.
- Lackey, Jennifer. 2008. *Learning from Words: Testimony as a Source of Knowledge*. Oxford University Press.
- Laland, Kevin N. 2004. ‘Social Learning Strategies’. *Animal Learning & Behavior* 32 (1): 4–14. <https://doi.org/10.3758/BF03196002>.
- Levy, Neil. 2021. *Bad Beliefs: Why They Happen to Good People*. Oxford, New York: Oxford University Press.
- Levy, Neil, and Mark Alfano. 2020. ‘Knowledge From Vice: Deeply Social Epistemology’. *Mind* 129 (515): 887–915. <https://doi.org/10.1093/mind/fzz017>.
- McMyler, Benjamin. 2022a. ‘Towards an Epistemology of Cultural Learning’. *Philosophical Issues* 32 (1): 304–19. <https://doi.org/10.1111/phiss.12212>.
- . 2022b. ‘Encultured Knowing: Knowledge Transmission and Varieties of Cultural Learning’. *Synthese* 200 (5): 391. <https://doi.org/10.1007/s11229-022-03876-8>.
- Mesoudi, Alex. 2016. ‘Cultural Evolution: A Review of Theory, Findings and Controversies’. *Evolutionary Biology* 43 (4): 481–97. <https://doi.org/10.1007/s11692-015-9320-0>.
- Mesoudi, Alex, and Alex Thornton. 2018. ‘What Is Cumulative Cultural Evolution?’ *Proceedings of the Royal Society B: Biological Sciences* 285 (1880): 20180712. <https://doi.org/10.1098/rspb.2018.0712>.
- Meylan, Anne. 2017. ‘The Consequential Conception of Doxastic Responsibility’. *Theoria* 83 (1):

- 4–28. <https://doi.org/10.1111/theo.12110>.
- Millar, Boyd. 2021. ‘Shared Epistemic Responsibility’. *Episteme* 18 (4): 493–506. <https://doi.org/10.1017/epi.2019.21>.
- Müller, Basil. 2024. ‘Bad Social Norms Rather than Bad Believers: Examining the Role of Social Norms in Bad Beliefs’. *Synthese* 203 (2): 63. <https://doi.org/10.1007/s11229-024-04483-5>.
- Nagell, Katherine, Raquel S. Olguin, and Michael Tomasello. 1993. ‘Processes of Social Learning in the Tool Use of Chimpanzees (Pan Troglodytes) and Human Children (Homo Sapiens)’. *Journal of Comparative Psychology* 107 (2): 174–86. <https://doi.org/10.1037/0735-7036.107.2.174>.
- Nguyen, C. Thi. 2023. ‘Hostile Epistemology’. *Social Philosophy Today* 39: 9–32. <https://doi.org/10.5840/socphiltoday2023391>.
- Ofek, Haim. 2004. *Second Nature - Economic Origins of Human Evolution*. Cambridge.
- Palermos, Spyridon Orestis. 2020. ‘Epistemic Collaborations: Distributed Cognition and Virtue Reliabilism’. *Erkenntnis*, April. <https://doi.org/10.1007/s10670-020-00258-9>.
- Pritchard, Duncan. 2015. ‘Epistemic Dependence’. *Philosophical Perspectives* 29: 305–24.
- . 2021. ‘EPISTEMIC DEPENDENCE’. *Philosophical Perspectives*, 21.
- Sertler, Ezgi. 2022. ‘Epistemic Dependence and Oppression: A Telling Relationship’. *Episteme* 19 (3): 394–408. <https://doi.org/10.1017/epi.2020.34>.
- Simion, Mona. 2021. ‘Testimonial Contractarianism: A Knowledge-First Social Epistemology’. *Nous* 55 (4): 891–916. <https://doi.org/10.1111/nous.12337>.
- Sperber, Dan, Fabrice Clément, Christophe Heintz, Olivier Mascaró, Hugo Mercier, Gloria Origgi, and Deirdre Wilson. 2010. ‘Epistemic Vigilance’. *Mind & Language* 25 (4): 359–93.
- Sterelny, Kim. 2012. *The Evolved Apprentice*. MIT press.
- . 2021. *The Pleistocene Social Contract: Culture and Cooperation in Human Evolution*. Oxford, New York: Oxford University Press.
- Tanesini, Alessandra. 2022. ‘Scaffolding Knowledge’. *Philosophical Issues* 32 (1): 367–81. <https://doi.org/10.1111/phils.12234>.
- Tehrani, Jamshid J., Jeremy Kendal, and Rachel Kendal, eds. 2023. *The Oxford Handbook of Cultural Evolution*. Oxford University Press.
- Tennie, Claudio, Josep Call, and Michael Tomasello. 2009. ‘Ratcheting up the Ratchet: On the Evolution of Cumulative Culture’. *Philosophical Transactions of the Royal Society B: Biological Sciences* 364 (1528): 2405–15. <https://doi.org/10.1098/rstb.2009.0052>.
- Tomasello, Michael, Alicia P. Melis, Claudio Tennie, Emily Wyman, and Esther Herrmann. 2012. ‘Two Key Steps in the Evolution of Human Cooperation: The Interdependence Hypothesis’. *Current Anthropology* 53 (6): 673–92. <https://doi.org/10.1086/668207>.
- Toole, Briana. 2019. ‘From Standpoint Epistemology to Epistemic Oppression’. *Hypatia* 34 (4):

598–618. <https://doi.org/10.1111/hypa.12496>.

Turri, John, Marc Alfano, and John Greco. 2021. 'Virtu Epistemology'. In *The Stanford Encyclopedia of Philosophy*, edited by Edward N Zalta.

<<https://plato.stanford.edu/archives/win2021/entries/epistemology-virtue/>>.

Williamson, T., and J. Stanley. 2001. 'Knowing How'. *Journal of Philosophy* 98 (8): 411–44.