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Epistemic Curses: The curse of knowledge and the curse of expertise

Abstract. The *curse of knowledge* (e.g., Newton 1991; Wieman 2007; Xiong, Weelden, and Franconeri 2019) and the *curse of expertise* (Fisher and Keil 2016) are widely known in social psychology, less so in social epistemology. Our aim in this paper is to do three main things. First, we show that the curses of knowledge and expertise are such that we can expect them to regularly wreck epistemically successful communication in predictable ways. We argue, secondly, that this fact should make us less optimistic than social epistemologists typically are about the social-epistemic value of speaker knowledge (and expertise) across testimonial exchanges. Thirdly, we draw attention to a substantive implication the foregoing has for anti-reductionists in the epistemology of testimony (e.g., Graham 2016) who appeal to a filtering condition on the hearer's side to account for testimonial entitlement.

1. Here is a package of ideas in social epistemology that is widely taken for granted rather than explicitly argued for – especially (though not exclusively) by anti-reductionists in the epistemology of testimony.[1]

[1]In particular, we have in mind here anti-reductionists who embrace *transmission principles* in the epistemology of testimony: principles according to which speaker knowledge is what 'makes the difference' for whether a hearer's testimonially based belief qualifies as knowledge. For example, according to (among others) Ross (1986), Burge (1993), Welbourne (1983), Audi (1997), and Faulkner (2011), a hearer's testimony-based belief that P qualifies as knowledge only if the speaker (or someone in the chain of sources) knows that P (Graham 2016, 174; cf., Carter and Nickel 2014). For defences of the speaker-knowledge and hearer-knowledge connection in the sufficiency direction, see Burge (1993), Coady (1992), and Sutton (2007). For an overview, see Adler (2017).

(a) Ceteris paribus, speaker knowledge contributes to successful communication in the following sense: when a hearer H relies on a speaker S's testimony to form a testimony-based belief (TBB) about whether P, H is epistemically better off if S knows a lot about P (including that P is true) than otherwise, where 'epistemically better off' is a matter of the epistemic status of the hearer's TBB about whether P.

(b) Ceteris paribus, when a hearer H relies on a speaker S's testimony to form a testimony based belief (TBB) about whether P in a specialised knowledge domain D, the hearer is epistemically better off if S is an expert in domain D than otherwise, where D-expertise implies (at least) D-relevant specialised knowledge.

Call this package of views *speaker knowledge optimism.* At the crux of this picture is a straightforward idea: that if you want to know whether P and ask someone, the *more that person knows* about what it is you're asking them about, the better positioned they are to pass that knowledge on to you.

In what follows, we take issue with this simple picture, or at least, to its largely unchallenged status in social epistemology. In what follows, we argue that the connection between speaker knowledge and (epistemically) successful communication is much more complex than the speaker knowledge optimist submits, and that across a relatively significant range of cases, more speaker knowledge is actually bad news for the hearer. We conclude by showing how the empirical basis for our pessimism about speaker knowledge optimism turns out to have important implications for anti-reductionists about testimonial entitlement.

Here is the plan. §2 and §3 discuss two 'epistemic curses': the *curse of knowledge* (e.g., Newton 1991) and the *curse of expertise* (e.g., Fisher and Keil 2016), and then show – with reference to Gricean maxims – how each curse is primed to wreck epistemically successful communication in its own distinctive way. §4 concludes by showing what the foregoing means for anti-reductionists like Peter Graham (2016) who source epistemic entitlement in part in a filtering condition on the hearer's side.

2. In 1990, Stanford PhD student Elizabeth Newton (1991) devised an experimental game. In the game, participants were assigned one of two roles: "tapper" or "listener". Participants who were assigned the role of 'tapper' were supposed to pick out a well-known song and then tap out the rhythm on a table. (The reader might want to see if they can do this right

now, and think about whether you think *others* would be able to recognise the song you have in mind). Participants assigned the role of 'listener' were supposed to guess the well-known song that the tapper tapped. The second job of the tapper was to predict how often the listener would get it right. The tappers prediction? 50%. As it turns out, the success rate was not 50% as predicted, nor was it anywhere near that. It was just 2.5%; the listeners were only able to guess *three* of the 120 songs that were tapped.

Netwon stumbled upon an important idea. In short, when you know something, it is surprisingly difficult to think about it from the perspective of someone who does not know it. This is the *curse of knowledge.*[2]

To get a feel for the strength of the curse (e.g., its resilience to being overridden even by blatant self-interest), consider a case from economics, reported by Camerer, Loewenstein, and Weber (1989), in which knowledgeable sales persons were shown to have more difficulty than less knowledgeable salespersons adjusting their pricing as well as sales pitch to novice buyers. In the case of the less knowledgeable salespersons (about the product they were selling), the knowledge gap between themselves and the novice buyers was smaller, and so there was less need to think about the perspective of a customer who knows less than you.

Of course, in Camerer et al.'s study, the *point* of the kind of communication impeded by the curse of knowledge was entirely *practical*: to sell products and make a profit. Of particular interest to social epistemologists are cases where knowledgeableness impedes communication with the aim of transferring knowledge.

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[2]The curse of knowledge is often discussed in connection with what is called the egocentric bias (e.g., Ross and Sicoly 1979). Our understanding is that these are not quite the same. The egocentric bias is more general. It involves being disposed to attribute one's own mental states, attitudes, etc. to others. The curse of knowledge is best understood as a special case of the egocentric bias, where the relevant mental states are one's knowledge states. Of course, since it's widely taken in epistemology that it's false that, if one knows that P, then one knows that one knows that P (cf., Greco 2014), a knowledgeable testifier might not always know she is knowledgeable in testifying. Conversely, some mere believers might very well take themselves to be knowledgeable about a topic and be mistaken. While we are restricting our discussion of the curse of knowledge to cases of genuine knowledge on the part of the speaker, we grant entirely that there are plausibly variations on the curse of knowledge where the same kinds of mechanisms can lead to bad communication for *mere* believers who think they possess knowledge but are mistaken.

One domain where this has been studied is that of science education – in particular, in the case of teaching students physics – as has documented in a series of papers by physicist and educationalist Carl Wieman (2007). Wieman describes his results rather bleakly:

> […] physicists are achieving poor educational results because the "curse of knowledge" makes it very difficult for them to understand how physics is best learned by a novice student, or to accurately evaluate that learning (2007, 2).

Studies at the University of Maryland (e.g., Redish, Saul, and Steinberg 1998; Adams et al. 2006) have discovered that this is particularly the case when it comes to communicating physics 'metabeliefs', which are 'general beliefs about the nature of physics, how it is learned and used, and how physics knowledge is established', which physics instructors might be especially likely to 'forget' that those they are teaching science to don't already share with them. As Wieman (2007) puts it:

> We have consistently measured that such student beliefs, on average, become less like those of a scientist after completing typical introductory college (2007, 2).

Perhaps the most well-documented recent case linking the curse of knowledge to bad communication comes from Xiong, Weelden, and Franconeri (2019), and it shows how knowledgableness can impede, in particular, successful data communication. In Xiong et al.'s study, participants were told different backstories about political events events affecting public poling data, after which they were shown a graph depicting that data. As Xiong et al. describe:

> One pattern in the data was particularly visually salient to them given the backstory that they heard. They then predicted what naive viewers would find most visually salient on the visualization. They were strongly influenced by their own knowledge, despite explicit instructions to ignore it, predicting [incorrectly] that others would find the same patterns to be most visually salient (2019, 1077).

This again is a case where knowledgeableness (in Xiong et al.'s study, knowledgeableness about the relevant political back story) not only makes a particular pattern visually salient, but it leads one who finds this pattern salient to poorly predict that individuals lacking this knowledge will find it salient as well.

The transition from the curse of knowledge to bad communication, in summary, goes as follows: knowledgeableness about a topic leads one to find it difficult to assume the perspective of someone who lacks that knowledge. When that person is the hearer, and is relying on the speaker for information, this poses a problem. The speaker, due to a difficulty in imagining the speaker's less knowledgeable situation (the curse of knowledge), will (in various ways) fail to transfer the information she intends to on account of failing to anticipate what is needed (by way of testimony) to close the knowledge gap between speaker and hearer.

To make this idea more concrete, just consider how the curse of knowledge can explain potential violations of each of Grice's (1991) four maxims of cooperative communication: *quantity, quality, relation* and *manner.*

(i) The *maxim of quantity* says (roughly) to be cooperatively informative, which involves giving as much information as is needed, and no more. The curse of knowledge can easily lead to misfires in both directions: viz., to providing testimony that presupposes information less knowledgeable speakers don't already have (too much information) and also to *leaving out* important details the speaker has trouble appreciating the hearer lacks (too little information). Wieman's (2007) case studies involving physics education offers plausible examples of the violation of this maxim in both directions.

(ii) The *maxim of quality* says to be truthful, and not to make false or unsupported statements.[3] With respect to satisfying this maxim, the risk posed by the curse of knowledge is *quality overshooting,* viz., meeting the maxim in ways that include sophisticated evidence whose rational force the hearer will not appreciate as supporting the statement. A notable example of 'quality overshooting' in connection with the curse of knowledge is noted by Jasanoff (1998), who has detailed the ineffectiveness of Barry Scheck's accurate though complicated DNA-

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[3]For an interpretation of Grice's quality maxim that assimilates quality to knowledge, see Matthew A. Benton (2016).

A research question posed in a recent 2016 study by Fisher and Keil (2016) was: Does expertise within a domain of knowledge predict accurate self-assessment of the ability to *explain* topics in that domain?

In conducting their experiments, Fisher and Keil tested how formal expertise, modelled as high levels of subject-specific education[5], impacts 'illusion of explanatory depth' (IOED). Participants first were asked to rate their explanatory ability at Time 1 and then after 'writing out as complete of an explanation as they can' (for some explanations in the area in which they had a college degree and others in areas they did not) they *rerated* their ability (Time 2).

Fisher and Keil's experiments lent support to their hypothesis that those with formal expertise tend to 'overestimate their ability to explain their own areas of formal expertise more than they do unfamiliar areas of formal expertise or familiar areas of passive expertise', where passive expertise is expertise through acquaintance though not through higher learning.

Fisher and Keil's assessment is that what explains why experts overestimate their ability to explain topics in their area of expertise is a 'failure to realize how much has been *forgotten* since they had maximum mastery of a topic' (2016, 1260)[6]. Put another way: experts fail to recognise the extent of the decay from "peak" to current knowledge. This is the *curse of expertise.* And Fisher and Keil suggest that this kind of overestimation might even be exacerbated the more experts rely on the internet to fill knowledge gaps, reliance that (as they've argued elsewhere[7]) inclines internet users to mistake knowledge 'in the head' with mere access to information.

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and Koehler, Brenner, and Griffin (2002).

[5]For the purposes of this paper, we are not staking any claim on whether Fisher and Keil's decision to model expertise in terms of subject-specific knowledge is the best way to do so. In fact, it might be that expertise comes in multiple forms, roughly corresponding to Weinstein's (1993) distinction between epistemic and performantive expertise. On this distinction, see also Steinkamp, Gordijn, and Ten Have (2008), Cholbi (2007) and Scholz (2018). See also Goldman (1999, 91) for a distinction between what he calls cognitive and skill expertise. For our purposes, we are simply making explicit what it is that the curse of expertise, as it's been tested by Fisher and Keil, involves (namely, certain kinds of knowledge), and how having such knowledge can bear on successful communication.

[6]Our italics.

[7]Note that this hypothesis is explored in its own right in previous work by Fisher, Goddu, and Keil (2015), which suggests that internet searching itself can affect our propensity to conflate knowledge we possess with knowledge we have access to. For a criticism, see [Redacted.]

Again, our objective here isn't to speculate about what the mechanisms are driving the curse of expertise. Rather, we want to consider briefly how the curse of expertise, given the specific kind of miscalibration it involves, is primed to wreck successful communication in its own distinctive ways, which differ subtly but importantly from the curse of knowledge.

With this in mind, let's refer back to the four Gricean maxims. With respect to *quantity* and *quality*, Fisher and Keil's (2016) experiments suggest that an expert's own assessment of both the quantity and quality metrics will be higher than that which she is actually offering when communicating an explanation (within their domain of expertise) to a novice hearer. In light of this, an expert testifier is more likely (when testifying in this area) to not only misjudge the accuracy of what they've communicated (given that they'll fail to recognise the extent of decay from peak to current knowledge on the topic) but also what's been left out of the explanation. A downstream implication here is that the curse of expertise will lead naturally to miscalibrated judgments about what (subsequent to a given explanation) they can assume is in the 'common ground' (e.g., Stalnaker 2002).

A knock on effect, then, is that the curse of expertise is primed to wreck not only an expert speaker's initial explanations in an area of expertise, but also to some extent the further conversational dynamics between speaker and hearer, by corrupting what the expert testifier is likely to expect about which (future) assertions she makes will (and won't) cut down live options between speaker and hearer. In particular, the expert testifier can be expected to, after offering an expert explanation, think that they've cut down more live options in the common ground than they in fact had. Similar points can be made with respect to the maxims of *relation* and *manner*. When one initially *thinks* an explanation they've given is more informative than it is, this will influence which downstream assertions are taken to be relevant, and how follow-up explanations will be framed.

4. The empirical evidence for how the curse of knowledge and the curse of expertise can wreck successful communication suggests two interesting things for social epistemology. The first has to do with the role of knowledge in successful communication.

Remember the package of ideas we started out with: speaker knowledge optimism. In slogan form: hat if you want to know whether P and

ask someone, the *more that person knows* about what it is you're asking them about, the better positioned they are to pass that knowledge on to you. We offered evidence for a revision. More accurately – and rather than what the speaker knowledge optimist submits, unqualified – what we should say is: speaker knowledge has important *disadvantages vis-à-vis* successful communication that we should not overlook when simply taking its many benefits for granted.[8]

We now want to suggest that empirical cases for the curses of knowledge and expertise also suggest a second and more specific ramification for social epistemology, and for anti-reductionists in the epistemology of testimony specifically.

Reductionism in the epistemology of testimony holds that you need to have independent inductive reason to trust a speaker in order to be entitled to believe what they tell you. Anti-reductionism, the much more widely accepted position, holds that testimonial entitlement is easy to come by and that (roughly) you just have to listen to what you're being told.[9] That's more or less enough to be *prima facie* epistemically justified (hereafter: entitled) in believing a speaker's testimony.

Anti-reductionism clearly puts less responsibility on the hearer than reductionism does.[10] And one obvious worry that any anti-reductionist has

[8]We want to emphasise that the sense in which the empirical evidence should lead us to reexamine speaker knowledge optimism is not such that we take it to suggest in any way that, *all things considered*, we should not seek testimony from an expert as opposed to a non-expert. It will often be, after all, that an expert's knowledge-generated blindspots are not manifest in particular pieces of testimony. And even more, there will be occasions where an expert's knowledge generated blindspots do undermine the quality of their testimony, but not so much that it would make their testimony less valuable than the testimony of someone who was not knowledgeable about the topic at hand. That said, we do hope to have shown two senses in which it is a speaker's knowledge that leads them to make mistakes in communication, mistakes that have epistemic costs for the hearer.

[9]See, e.g., Simion and Kelp (2018), Lackey (1999), Faulkner (2011), Fricker (2006), and Adler (2017) for helpful discussions.

[10]Note that all forms of anti-reductionism are compatible with the idea that there are prescriptive norms that apply to speakers, apart from any burden a hearer must meet if she is to be entitled to accept what the speaker says. Indeed, Gricean maxims are examples of such norms. Moreoever, in the case of expert testimony in particular, it might be that there are specific norms governing explanation that expert testifiers ought to satisfy simply in their capacity as speaking as experts. For example, it might be that some speakers incur additional burdens when speaking *as* experts. For discussion on this point, see Goldberg (2018) and Lackey (2016); cf., Matthew A Benton (2016).

to answer for in light of this is *how* can it be that testimonial entitlement comes so cheaply? What explains this? Simion and Kelp (2018) call this the *source problem* for anti-reductionism.

There are two main brands of anti-reductionism in the contemporary literature, and these deal with the source problem differently. What we can call *strong* anti-reductionism says that comprehension on the part of the hearer does all the work needed to address the source problem. This is the position defended on *a priori* grounds by Tyler Burge (1993). In outline form, Burge's idea is as follows: when someone says something intelligible to you, one thing you can already tell without having to know anything else about the speaker is that you're dealing with a *rational* source, one with a capacity to reason. The next step in Burge's *a priori* argument for anti-reductionism involves a claim about the capacity of reason itself, namely, that has truth as its function. The idea is that reason is working well if and only if it gets to the truth reliably, and so has truth as its truth as its function – viz., truth is the standard for correctness that we can appeal to when assessing whether reason is functioning well. Now, if that's all right, then notice what we are, conveniently, in a position to tell from the bare fact that someone has told us something intelligible. We are in a position to tell that the intelligible content is content that derived from a source that has truth as its aim. This is already enough, Burge thinks, for us to be justified in thinking that what was said to us is true as long as we don't have any positive reason to think otherwise.

Most anti-reductionists however aren't so optimistic that comprehension alone can do all the entitlement-relevant work on the hearer's side. After all, sometimes the speaker's faculty of reason is put in the service of lying and deceiving in order to further practical ends.[11] Doesn't the hearer therefore need to do more than just understand the what the speaker has said to be entitled to accept it? A more promising version of anti-reductionism deals with the source problem by having the hearer shoulder a bit more weight; what's needed on the part of the hearer for Graham (2016) is what he calls *comprehension-plus-filtering*, where filtering involves monitoring for signs of deception and incompetence.

It's beyond the scope of what we want to do here to adjudicate the dispute between Burge and Graham. We will simply take for granted that Graham's more moderate version of anti-reductionism is more promis-

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[11]For discussion, see Simion and Kelp (2018, 3), Simion (2018), and Goldberg (2014).

ing as a way of addressing the source problem. With this assumption in place, we want to shift focus to the *scope* of filtering for a Graham-style anti-reductionist: that is, on what the hearer should be filtering *for*?

Graham's two filtering targets are *incompetence* and *deception.* This is a good start. Incompetence and deception can come apart in both directions, and either on the part of a speaker is sufficient for a hearer to acquire a false testimony based belief.

What we want to now suggest is that the empirical evidence for the curses of knowledge and expertise supports a third target for anti-reductionist filtering: filtering for what we'll call *knowledge-generated blindspots.* Knowledge-generated blindspots result from speaker knowledge and expertise, and issue in bad communication when they do on account of oversights that are themselves due to the speaker's knowledge.

Knowledge-generated blindspots include, in the case of the curse of knowledge, blindspots that knowledgeable speakers have about what other people know, and which can wreck successful communication. Consider the following example:

> QUANTUM ENTANGLEMENT: A knowledgeable theoretical physicist predictably forgets that her hearer won't have the same background knowledge as she, and she proceeds to offer an explanation about quantum mechanics that refers to Einstein's phrase 'spooky action at a distance' – a phrase which knowledgeable hearers will know refers to scientifically observed quantum entanglement, and not to anything ghostly or unscientific. The hearer, taking the phrase at face value, has been misled, and walks away with a false belief that scientists nowadays have lowered their standards.

The hearer's aim of acquiring knowledge from the speaker has been compromised in QUANTUM ENTANGLEMENT but not through deception *nor* through incompetence, but through a particular kind of knowledge-generated blindspot. Better than comprehension-plus-filtering (for incompetence and deception) is comprehension-plus-filtering for incompetence, deception, *and* blindspots. A hearer with the capacity to filter for this will reliably prepare herself better for accepting testimony from experts, one of the most valuable sources of testimony we have. She will appreciate that the known to be knowledgeable source will make certain predictable mis-

takes, and will accordingly request certain kinds of clarifications, and will double check as appropriate, prior to belief uptake.

In the case of the curse of expertise, knowledge-generated blindspots include blindspots about what the speaker *still knows* and which can wreck successful communication. Consider the following example:

> LANDING GEAR: The speaker is, suppose, an aeronautical engineer giving instructions to a trainee about how to safely repair faulty landing gear on a Boeing 737 aircraft. The expert (due to the curse of expertise) remembers it being much easier to fix this than it is. The expert's instructions accordingly leave out some steps that are relevant, and include just A, B, and C (which the expert remembers are salient). The hearer, taking the testimony at face value, has been misled, and walks away with a false belief that the three salient steps for fixing the landing gear are steps, A, B, and C. Doing just these steps, however, will not fix the landing gear. You also need steps E and D, which the expert glossed over.

Again, in this case, the hearer's aim of acquiring knowledge from the speaker has been compromised, but not through incompetence nor through deception, but through a particular kind of knowledge-generated blindspot. Better than comprehension-plus-filtering (for incompetence and deception) is comprehension-plus-filtering for incompetence, deception, and blindspots. A hearer with the capacity to filter for this will reliably prepare herself better for accepting testimony from experts. She will appreciate that the known to be knowledgeable source will make certain predictable mistakes, and will accordingly request certain kinds of clarifications, and will double check as appropriate, prior to belief uptake.

Promising versions of anti-reductionism in the epistemology of testimony should accordingly adapt to include a more inclusive approach to the skill of filtering, one that will lead to less mistakes.

5. The curses of knowledge and expertise are well known in social psychology, less so in social epistemology. Our aim has been to show three main things. Firstly, that the curses of knowledge and expertise are such that we can expect them to regularly wreck epistemically successful communication in predictable ways. Second, that this fact should make us

less optimistic than social epistemologists typically are about the social-epistemic value of speaker knowledge (and expertise) across testimonial exchanges. And, third, we've shown that the basis we've given for challenging the package of views we've called 'speaker knowledge optimism' should also lead anti-reductionists in the epistemology of testimony to make a new and needed move when addressing the source problem by appeal to a filtering condition.

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