**Experts: What Are They and How Can Laypeople Identify Them?**

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In complex modern societies, the production and social spread of knowledge both rely on the division of cognitive labor. Typically, the collaborators are not simply epistemic equals, such that anyone could do each of the diverse cognitive jobs, but instead differ strongly in their cognitive skills. Experts, in this respect, are top performers in their respective domains of expertise. They are particularly competent at specific cognitive tasks, owing these abilities to individual talent and rigorous training. Many experts are scientists. Moreover, experts typically occupy powerful and highly influential social roles. Given their high credibility, they serve as teachers or advisors of individual laypeople, public opinion and political deliberation.

From a philosophical point of view, a number of closely related questions must be addressed: (1) *What is an expert?*, (2) *How can laypeople identify the relevant experts?*, and (3) *How much weight should laypeople assign to expert testimony?* These questions are not mutually independent, since the epistemology and metaphysics of experts should go hand in hand. Here is one way of revealing this interrelationship: Experts can play specific testimonial roles for laypeople, e.g. as epistemic authorities. But they can only do that if they possess specific properties. But how can laypeople then recognize that the putative experts really have these properties? Whereas the testimonial role of experts will only be briefly touched upon in this chapter (for more on this, see chapter # on ↑ epistemic authority), its main sections will address question (1) *What is an expert?* and question (2) *How can laypeople identify the relevant experts?* The final section concerns the applicability of the theoretical framework. It will scrutinize laypeople’s ability to identify the superior expert in a real-world scenario of conflicting experts, namely the recent German controversy over the harmfulness of nitrogen oxides.

*1. What is an expert?*

Any attempt to define experts should start with a list of uncontroversial features of being an expert. In this category clearly belongs the observation that there are two different kinds of experts: *performative* and *cognitive* experts (Goldman 2018: 4). Performative experts are very competent at *doing* things; e.g. craftsmen competently build houses or tables; chess players competently play chess; and professional soccer strikers competently score goals. Cognitive experts, on the other hand, competently produce *judgments*.[[1]](#footnote-1) In what follows, I will focus on cognitive experts. Second, expertise is restricted to specific domains, i.e. it is always specialized in disciplines, sub-disciplines or highly specific tasks. Even if it would make philosophers’ dreams come true, nobody can be an expert on everything. Third, cognitive experts are not only competent judgers; they are also epistemically superior to laypeople. This comparative condition seems to be built into the meaning of our term ‘expert’. It rules out the possibility of everyone being an expert at the same task (see Goldman 2018, Fricker 2006, Coady 2012, Martini 2020; *pace* Collins 2014: 53).Fourth, being an expert is not the same as having the reputation of being one (Goldman 2018: 2). To avoid problems of circularity in the reputational definition of experts, let us assume that the reputation of being an expert can be spelled out in terms of having the reputation of being epistemically superior to the majority in one’s judgments about the respective domain. The required reputation, however, is not necessary for being an expert, as illustrated by the example of unrecognized scientific geniuses. Nor is it sufficient for being an expert. For example, charlatans and false experts have the required reputation, but still lack the relevant competences.[[2]](#footnote-2)

Recently, purely functional definitions of experts have been suggested. The idea here is that the meaning of the term ‘expert’ can be analyzed solely in terms of a specific social function, which in turn can be metaphysically explained by its categorical basis (Goldman 2018). What are the functional definitions that are suggested by the proponents of this approach? According to the *novice-oriented account* (Quast 2018, Goldman 2018), being an expert is synonymous with being someone who has the capacity to help laypeople cognitively. ‘Cognitive help’ should be understood here as a success term that requires the successful transmission of true beliefs or knowledge. This account of experts clearly fails (for the following, see also Croce 2019: 13-15). Experts may completely lack didactic abilities and therefore fail to be successful in teaching laypeople. Hence, the novice-oriented account does not supply necessary conditions for expertise. Neither does it supply sufficient conditions: A good teacher needn’t be a genuine expert; and someone who is largely incompetent in a specific domain might still help others with a few true beliefs. Alternatively, Croce 2019 suggests a *research-oriented account* of expertise. Accordingly, being an expert is defined in terms of having the capacity to help the scientific discipline make progress (Croce 2019: 4). However, there are clear counterexamples to this suggestion too. First, experts needn’t have the capacity to promote scientific progress, because they may lack essential capacities for scientific collaboration (imagine an expert who just lost his ability to speak and write due to a recent stroke, but who still thinks clearly about his domain of expertise; or imagine an expert logician who uses a private and publicly inaccessible notation for his proofs). Moreover, some experts are specialized in non-scientific domains (imagine an expert on the origin and quality of wine). Hence, the capacity to promote scientific progress is not necessary for expertise. Second, having the capacity to promote scientific progress in a domain is also insufficient for being an expert in that domain. For example, mathematicians have helped the disciplines of biology, psychology and economics to make enormous progress, despite not being experts in biology, psychology, or economics themselves. Hence the concept of being an expert cannot be *analyzed* as referring to a property of social function. Of course, I do not dispute that experts *typically* (although not necessarily) fulfill specific social functions such as informing laypeople and promoting scientific progress. These are even platitudes about experts.

In what follows, I will use the tools of a network analysis of meaning to establish a correct definition of being an expert. I will start by giving a list of common platitudes about experts, and then proceed by checking whether the standard definitions of experts match these platitudes. Here is an annotated list of platitudes about experts:

(1) *Epistemic Superiority*: Cognitive expertise requires cognitive competence (concerning some domain D) that is superior to laypeople’s respective competences (Goldman 1999: 268; Fricker 2006: 233; Coady 2012: 28).

 *Comment*: Expertise involves a comparative condition that requires experts to be significantly better than average.

(2) *Reliability-is-not-enough*: Those who are highly reliable in their judgments concerning some domain D, but do not have many beliefs about D, are clearly not experts (Scholz 2009: 193; Coady 2012: 29; Croce 2019: 6).

 *Comment*: Reliability can come at the price of ignorance, in cases of negligent or skeptical epistemic agents. However, someone who is reliable about D because she suspends judgment on basically everything is clearly not an expert in that domain.

(3) *Epistemic Authority*: Expertise in D grounds the epistemic authority of the expert’s judgments about D in relation to laypeople (Constantin & Grundmann 2018).

 *Comment*: A layperson L treats A as an epistemic authority concerning domain D if and only if L defers to any of A’s judgments in D, no matter what L’s other p-relevant reasons are. Identifying someone as an expert justifies treating her as an epistemic authority.[[3]](#footnote-3)

(4) *Information-is-not-enough*: One does not become an expert just by being told (or reading) a lot of truths.

 *Comment*: Consider Jane, who believes whatever she reads about D in a reliable textbook (or whatever she is told by a genuine expert). Imagine further that Jane is unable to form any true beliefs about D by reasoning herself on the basis of the D-related reasons that are given to her. Intuitively, Jane is not an expert about D (for a similar case, see Croce 2019: 10)

(5) *Relative-cum-absolute*: Being an expert is time-relative, but it also requires that some absolute condition is satisfied (Goldman 2018: 5).

 *Comment*: The astronomer Ptolemy was an expert in his time. The actual Ptolemy, transplanted to the present day, would not be an expert today. However, were he to live today he would eventually become an expert. In contrast, the phrenologist Franz Gall was never an expert, because one cannot competently assess personality on the basis of the skull’s shape.

(6) *Understanding-is-not-necessary*: Experts needn’t have any understanding of their domains of expertise.

 *Comment*: Understanding a domain requires a vast amount of knowledge about it, including knowledge of causes and other explanatory grounds. The tighter and more systematic one’s explanatory knowledge-why is, the better one’s objectual understanding is (Khalifa 2013). Now, consider the Indian mathematician Ramanujan (1887-1920). He was able to grasp the correct solutions to many complex mathematical problems without having proofs of them. Ramanujan seems to have been an expert, without possessing any understanding of why his mathematical solutions were correct.

(7) *Being-a-successful-teacher*: Experts typically inform and teach laypeople successfully (Quast 2018).

(8) *Making-scientific-progress*: *Experts* typically contribute to scientific progress in their domain of expertise (Croce 2019).

On the basis of these platitudes, the standard accounts of experts can now be assessed.

*Veritistic accounts* claim that experts can be defined in terms of their amount of true beliefs, or the ratio of their true and false beliefs about D. According to the *gnostic account*, expertise depends on the amount of genuine knowledge (not just true beliefs) of D. On the *understanding-linked account*, experts are defined in terms of the degree of their objectual understanding of D. Finally, *evidence-linked accounts* define experts in terms of the amount of evidence they possess, and their ability to reason properly on the basis of this evidence.

What resources has the veritistic account to explain the above list of platitudes? A rather *simple version of veritism*, VA1, claims that someone is an expert if and only if she has more true beliefs about D than the majority (Coady 2012: 28). Although VA1 can explain why an expert is typically a successful teacher (*Being-a-successful-teacher*), it faces severe objections. First, someone who is more gullible than the majority may have more true beliefs than the majority, because the critical assessment of testimonial judgments sometimes filters out true judgments. For this reason, she will count as an expert according to VA1. But this conflicts with another platitude, namely (*Epistemic Superiority*), since a more gullible person is clearly not more competent. The more gullible person, despite having more true beliefs, may be less competent, since gullibility typically lowers the truth-ratio. Second, VA1 is in tension with the platitude of *Epistemic Authority*. To see this, suppose that the majority is quite skeptical in their judgments about D. Now let Ben be one of the few people in the community who are gullible in their judgments about D. If the skeptics recognize this fact, they must treat Ben as an expert (because he has more true judgments about D than the skeptics). However, a skeptic will not be justified in treating an identified gullible person as her epistemic authority, as the platitude of *Epistemic Authority* requires.

In response, veritists may revise their account along the following lines:

(VA2) E is an expert about D if and only if E has more true and/or less false beliefs about D than the majority (Goldman 2001: 91).

This formula permits two different readings. Consider first the disjunctive reading: An expert has more true *or* less false beliefs. This definition fails because having less false beliefs than the majority is clearly *not sufficient* for being an expert. Otherwise, negligent people and skeptics would count as experts, which—according to platitude of *Reliability-is-not-enough*—they are not (Scholz 2009, Coady 2012). Now consider the conjunctive reading: An expert has more true *and* less false beliefs than the majority. This definition fails as well, because having less false beliefs than the majority is *not necessary* for being an expert. Consider a case in which most laypeople have no interest in D and therefore rarely form any beliefs about D. This protects them from having many false beliefs. In contrast, a genuine expert will produce a large amount of beliefs about D, and therefore runs the risk of having many more false beliefs than disinterested laypeople (Croce 2019: 7).

Why can’t a high truth-ratio fully capture expertise? As the cases of negligent people and skeptics nicely illustrate, an excellent truth-ratio does not guarantee that the epistemic agent is able to answer many questions about the target domain truly. She might be completely ignorant about the target domain, thus lacking epistemic power, i.e. the ability to produce a large number of true beliefs (Goldman 1984: 27). In order to fix this problem with VA2, veritists may thus require power in addition to reliability for expertise.[[4]](#footnote-4) One can use the notion ‘objectual competence’ to combine both conditions.[[5]](#footnote-5) Whereas a judgment is competently produced if it is based on a reliable process, we will say that an agent has objectual competence concerning domain D if she is able to form many beliefs about D in a reliable manner. This naturally leads to the following account of experts:

(VA3) E is an expert about D if and only if E has more (objectual) competence concerning D than the majority.

This veritistic definition looks fine at first sight. But it still has problems that require further tweaking. First, without any threshold condition on the degree of required competence, the expert might only be slightly more competent than the majority of extremely incompetent people. But then an expert might still be unreliable in an absolute sense (e.g. below .5). This is clearly in tension with the platitude of *Epistemic Authority*, according to which experts must be testimonial authorities to which one should defer. For this reason, the definition needs to be supplemented by a threshold clause.[[6]](#footnote-6) Second, the definition as it stands also needs to be relativized. Consider again the case of Ptolemy (*Relative-cum-absolute*). He was an expert astronomer in his time, although he is certainly not more competent at astronomy than the majority today. He didn’t even know what every high school student knows today, namely that the earth rotates around the sun. One can fix this problem by relativizing expertise to times (and maybe even to locations).

This leads to the following, final version of the veritistic account:

(VA4) E is an expert about D at time t if and only if E is objectually more competent concerning D than the majority at t and E is sufficiently competent concerning D.

This is, most likely, the best definition of experts that the veritist can get at. Obviously, it fits well with many of the platitudes. It requires a competence superior to that of laypeople (*Epistemic Superiority*). It rules out negligent people and skeptics, because objectual competence involves power (*Reliability-is-not-enough*). This definition also guarantees some testimonial authority (*Epistemic Authority*), because it requires sufficient competence. The relativization of the definition allows us to claim that Ptolemy was an expert in his time, and the threshold clause allows us to explain why Gall was never an expert (*Relative-cum-absolute*). The required high level of competence concerning the target domain explains why experts are typically virtuous advisors and fruitful scientific collaborators (*Being-a-successful-teacher, Making-scientific-progress*). Since understanding is not required by the definition, it is also in line with (*Understanding-is-not-necessary*).

The crucial and, as far as I can tell, fatal objection to VA4 relates to the platitude of *Information-is-not-enough*. Consider the case of Free Rider. Max doesn’t know anything about complex mathematics himself and cannot produce any mathematical proofs. However, he is lucky. His close friend Andrew is a world-famous mathematician, and whenever Max asks him anything about mathematics, Andrew gives him the answer in a trice. Given this background, Max has the ability to produce all kinds of mathematical beliefs that are almost always true. Max clearly has a competence in mathematics that is superior to that of the majority and sufficiently good.[[7]](#footnote-7) Given VA4, Max is thus an expert mathematician. But he is not. For he is unable to do any complex mathematics on his own. He has his competence only in virtue of having an expert mathematician as his reliable informant. It seems clear that someone who relies solely on testimony when producing beliefs about D will never be an expert about D, even if his testifier is a genuine expert himself. Free Rider is a decisive counterexample to VA4.

A currently widely neglected alternative to veritism is the *gnostic account* of expertise.[[8]](#footnote-8) This account defines experts in term of knowledge (which requires justification and an anti-luck condition that excludes Gettier-cases) rather than merely true beliefs.[[9]](#footnote-9) A corresponding definition would look like this:

(GA) E is an expert about domain D at time t if and only if E knows more about D than the majority at t and E possesses a sufficient amount of knowledge about D.

This definition rules out gullible and negligent people very elegantly, because gullible people do not possess *knowledge* (in the strong sense) and negligent people do not possess *more* knowledge than the majority. The absolute threshold condition is added to avoid a conflict with the platitude that experts have epistemic authority over laypeople (*Epistemic Authority*). If the expert only needs to have more knowledge than the majority, then she may still lack knowledge concerning the target proposition that is relevant for her to figure as an epistemic authority for the layperson. With respect to most of the other platitudes, GA fares as well as the best veritistic candidate. However, GA faces the same fatal counterexample as VA4: the case of Free Rider. Max acquires a lot of *testimonial* *knowledge* about mathematics from Andrew. In fact, this is more knowledge than the majority has, and even by absolute standards Max has a sufficient amount of mathematical knowledge. According to GA, Max thus counts as an expert mathematician. This, however, is counterintuitive.

In this respect, understanding-linked accounts represent a real advantage (Scholz 2009, Scholz 2018, Croce 2019). A corresponding definition might look like this:

(UA) E is an expert about domain D at time t if and only if E has a better (objectual) understanding of D than the majority at t and E has a sufficiently good understanding.

This account is quite congenial to many of the above platitudes. Although understanding is a controversial topic, I will rely on two assumptions that have a lot going for them. First, I assume that understanding a domain involves a large amount of explanatory knowledge (Khalifa 2013). Second, I assume that, in contrast to, e.g., true belief or knowledge, understanding is not simply transmitted through communication. Of course, a teacher may improve the pupil’s understanding by drawing her attention to the right aspects of the target issue. However, someone does not acquire understanding simply by being told why something happens or is the case. Now, if experts have understanding in this qualified sense, then they may be virtuous teachers or scientists (7, 8). UA also explains why skeptics and negligent people are not experts: They lack relevant understanding of the target domain. Interestingly, UA can also explain why Max in Free Rider is not an expert: He lacks understanding, which cannot be acquired merely on the basis of testimony. The real problem with UA is that it demands too much of experts. Sure, people who satisfy the definition are experts. But are these conditions necessary for being an expert? Here are two reasons to be skeptical. First, someone can be an epistemic authority for a layperson without having any understanding of the relevant domain. The Indian mathematician Ramanujan is a case in point. Lay mathematicians should clearly defer to his mathematical judgment (since he is extremely reliable), although Ramanujan has no understanding of mathematics, which would require being able to give proofs. Second, Ramanujan is intuitively an expert, although he lacks mathematical understanding. So, even if it is true that many experts have understanding of their domain of expertise, this property is not strictly necessary for being an expert.

These weaknesses of the understanding-linked account naturally lead to the evidence-linked account. Goldman 2018: 5, in passing, considers a variant of it. Here is, in my view, the best version of this account:

(EA) E is an expert concerning domain D at time t if and only if (i) E possesses more evidence pertaining to propositions in D than the majority at t & (ii) E has skills to reason on the basis of this evidence that are superior to (more conditionally reliable than) those of the majority at t & (iii) E is sufficiently competent concerning D on the basis of (i) and (ii).

In what follows, I will argue that this definition perfectly fits all of the platitudes, and is thus superior to any of its rivals. EA can obviously explain why experts are more competent than laypeople (*Epistemic Superiority)*, why the negligent and skeptics are not experts (because they do not satisfy (iii)), and why expertise is time-relative (*Relative-cum-absolute*). Moreover, it is not hard to see why EA does not require understanding (6), and why someone who satisfies this definition will often (although not necessarily) be a virtuous teacher and good scientific collaborator (7, 8). EA can also explain why Max in Free Rider is not an expert: Max is unable to reason competently on the basis of mathematical evidence, and acquires all his knowledge of D from Andrew. Finally, how does EA explain that when a layperson identifies an expert, she is justified in treating her as an epistemic authority? The explanation is twofold. First, when layperson L recognizes that expert E is sufficiently competent concerning her assertion that p (which follows from iii), L receives a testimonial reason to believe p. Second, when L also recognizes that E has considered more relevant evidence than he himself, and that E’s reasoning on the basis of this evidence is superior to his own (which follows from (i) and (ii)), he receives a higher-order reason to believe that any use of his p-relevant first-order reasons would lead to an irrational deviation from E’s assertion. This in turn undermines the rational force of his p-relevant first-order reasons. Hence, by recognizing that E has asserted that p, L receives a reason to believe p and an undercutting defeater for his further p-relevant reasons (see Constantin & Grundmann 2018). This explains why the layperson is rationally required to defer to the expert judgment.

So, what is an expert? As our previous discussion has shown, experts can neither be defined in terms of true beliefs, nor in terms of knowledge. The main problem with these accounts is that they have the counter-intuitive consequence that someone who has acquired all his beliefs about the target domain from testimony may count as expert. Defining experts in terms of understanding fares better in this respect. For someone who has acquired all his beliefs about the target domain from testimony does not automatically acquire understanding of this domain. The main problem with the understanding-linked account is that it requires too much of experts. As the case of Ramanujan nicely illustrates, experts needn’t have much understanding of their domain of expertise. The evidence-linked account does better. Accordingly, an expert is not only someone who possesses a particularly large body of domain-specific evidence, and who can reason particularly well on this basis, but is also someone who is objectively sufficiently good in these respects. Typically, these experts will have understanding, they will be successful in teaching laypeople, and they will be excellent scientific collaborators. However, these typical properties of experts are not necessarily tied to the nature of being an expert.

*2. How can laypeople identify the relevant experts?*

So far it has been argued here that experts are not only epistemically superiors to laypeople, but also objectively excellent judgers in their domains of expertise. So, if we laypeople ask ourselves whether some proposition that falls into some expert’s domain of expertise is true, we should follow her lead and defer to her judgment. But then it becomes highly urgent to find out who is an expert. More specifically, two different though closely related questions must be answered. One question is: *Who is a real expert?* When we try to answer this question we have to distinguish genuine experts from false experts and overconfident people (the novice/expert problem).[[10]](#footnote-10) The other question is: *Who is the better (or best) expert?* This question comes up when different experts have conflicting views, say about health security or the potential risks of a pandemic (the novice/2 experts problem).[[11]](#footnote-11)

Unfortunately, it is not an easy task for laypeople to identify experts, or to identify the better experts. Unlike bold people, experts cannot be directly perceived by laypeople. This is so because expertise involves complex capacities that manifest themselves, e.g., in the form of true beliefs whose truth-value is hard for laypeople to assess. Moreover, it won’t help much for laypeople to ask putative experts whether they are genuine experts. Their answers would not be significant, because even false experts or overconfident people would claim to be experts. Can laypeople identify experts by using the method of calibration (Kitcher 1993: 314-322)? According to this method, one can find out whether someone is competent in a specific domain by using one’s own judgments about this domain. If the person in question mostly agrees with one’s own judgment, then she is a genuine expert. If not, she is not an expert. However, this method only works for people who are experts themselves, and is thus not available to laypeople (Goldman 2001: 90). There are two reasons why laypeople cannot use calibration here. First, laypeople often have very few beliefs about specific domains of expertise, such that there is no basis for the calibration to rely on. Second, agreement with laypeople is neither necessary nor sufficient for being competent, because their lay beliefs about the domain may be massively false. However, isn’t there another easy way of telling who is an expert? Why can’t laypeople identify experts simply by observing who makes the more convincing statements or offers the more convincing arguments?[[12]](#footnote-12) This won’t work for a number of reasons. First, if the topic is a highly specialized one, laypeople often do not know what to think about it. So, they are unable to decide whether a claim is convincing or not. Second, even if laypeople are able to make up their minds, their assessment of expert judgments as convincing or unconvincing does not correlate with their truth or falsity. Laypeople often find true scientific theories completely counterintuitive and vice versa. Third, when laypeople assess the views of putative experts with respect to their plausibility, they have to rely on their own reasons and reasoning. But when faced with an expert, they are not permitted to do this, because they should treat experts as epistemic authorities, and this excludes the rational use of one’s own domain-specific reasons (see platitude 3).

So, expert identification is not at all an easy task for laypeople. Which further options are available to them? One must take into account that the task of expert identification can be divided into various parts. There is an easier task, namely finding out whether someone has more evidence than the majority, and whether she uses her domain-specific reasoning skills when forming her judgments. If someone works as a scientist, we can take for granted that these two conditions are satisfied. But there are also other ways of identifying this aspect of expertise. The harder task is to find out whether the putative expert is sufficiently competent, and more competent than the majority, in her judgments about the domain. This is harder, because it involves evaluating the reliability and power of the candidate. In what follows, I will focus on this harder task only.

When laypeople assess the competence of putative experts, they do not have conclusive evidence at their disposal. All they have to go on are indicators and traits of competence, which are fallible and defeasible. I want to distinguish between negative and positive indicators. Whereas negative indicators make it likely that the target assertion of a putative expert is not a manifestation of expertise, positive indicators make it likely that the target assertion is a manifestation of expertise. What kinds of negative indicators are available to laypeople? First of all, laypeople might observe traits of fraud, dishonesty or epistemic irresponsibility related to the putative expert (for the following, see Anderson 2011: 147-148). She may have used fraudulent scientific methods previously; she may intentionally misrepresent the views and arguments of others; she may cherry-pick evidence that is favorable to her own view; she may generally evade peer review, etc. Apart from these signs of deception, we should also not trust someone as expert if she turns out to be strongly influenced by biases (e.g. her social identity) in her judgment, or if she is not impartial in her judgment because she has certain interests in specific views coming out as true (see Goldman 2001: 104-105). If we, as laypeople, find any signs of dishonesty, bias or vested interests in putative experts, then we should not follow their lead, even if they generally have expertise in the relevant domain. On the other hand, the absence of any of these negative indicators does not make it likely that the candidate is an expert. Even non-experts can be honest, unbiased and impartial people.

Let us now move on to the positive indicators of expertise. These indicators must satisfy two conditions. First, they must make genuine expertise likely. Second, they must be available to laypeople. Otherwise, they would not be reliable indicators *for laypeople*. Here is a list of features that may be useful as lay indicators of expertise (for similar lists, see Goldman 2001; Anderson 2011: sect.2; Martini 2020: 118-19):

(A) track record,

(B) dialectical competence,

(C) teaching competence,

(D) reputation,

(E) scientific selection.

Let us assess each of these indicators in turn, starting with **track record** (A). As we saw above, calibration is not a good indicator of expertise for laypeople, because the layperson’s judgment is often not a good basis for evaluating expertise. But this is not generally true. In some cases, the truth-value of expert judgments can be correctly assessed by laypeople, if the status of these judgments changes from being esoteric, i.e. inaccessible to laypeople, to being exoteric, i.e. accessible to laypeople, over time.[[13]](#footnote-13) An example may help to illuminate this important point. Real experts are able to come up with correct predictions at a time when no one but experts can make these predictions. At this time, these statements are esoteric, i.e. they cannot be assessed by laypeople. There will, however, be a later time, when basically everyone can find out whether the prediction is true. Experts predict whether a certain comet will be visible on a certain day; they predict whether certain particles will be destroyed under certain conditions, what the weather will be like two days later, how a specific pandemic will develop over time, etc. At the time of the predicted events, even laypeople can see whether the comet is visible, the weather is as it was predicted, or whether the pandemic has developed as predicted. So laypeople can assess the competence of putative experts by checking whether their predictions later turn out to be true. This is also applicable to domains of engineering. Suppose a putative expert makes predictions about how to design a properly functioning device, or how to repair a defective device. Before taking any action, the typical layperson has no clue what to do. Later she can assess whether the putative expert’s predictions worked.

The track record of predictions in cases like these seems to be something that the layperson can rely on in order to find out who is an expert and who is a superior expert. But this procedure has very tight limitations. First, it is not generally true that experts can make predictions. This typically works for disciplines such as astrophysics, experimental physics and chemistry. However, biology, history, politics, math and philosophy are not predictive sciences in this sense. Second, not every confirmation of a previous prediction is accessible to the layperson. Many scientific predictions are reviewed in scientists’ laboratories, and the results are often not even intelligible to laypeople. Finally, taking the reliable track record of predictions as an indicator of true theories presupposes a realist understanding of scientific success. But of course, scientific realism is not uncontroversial. In short, the track record may be a reliable indicator of expertise in particular instances of specific disciplines, but it is surely not a generally useful method.

What about **dialectical competence** (B) as an indicator of expertise? More specifically, this would amount to two claims: (1) If someone has sufficiently good dialectical competence in a specific domain, then she is likely to be an expert; (2) if, in a debate between conflicting experts, one of them shows greater dialectical competence than the other, then this makes it likely, other things being equal, that the former expert is superior to the latter. How can one measure dialectical competence? The main idea is that one’s degree of dialectical competence is determined by factors such as one’s ability to raise objections and questions, one’s ability to answer questions and reply to objections, and the velocity of one’s argumentative moves (Goldman 2001: 95-96).

Indicators like these are clearly accessible to laypeople. They can observe how well someone does along these lines. However, they are not reliable indicators of real expertise. In this respect, a quack might perform as well as a genuinely competent expert, or even better. Laypeople cannot distinguish between cognitive competence in the field and skillful rhetoric when they use these criteria. One might of course tweak these criteria, such that they become reliable indicators of expertise. For example, one might measure the ability to raise *good* objections and *adequate* questions, or the ability to answer questions *correctly*. But then it is dubious whether laypeople can apply these revised criteria without already being experts themselves. Unlike Goldman, who considers dialectical competence to be a reasonably reliable criterion of expertise, I doubt that this has any substantial weight.

It has also been suggested (e.g. by La Barge 1997) that **teaching competence** is a reliable, and for laypeople, applicable indicator of expertise (C). A first worry concerns the observation that a lot of crazy stuff has been successfully taught, such that the people who were taught were then able to apply these contents to new cases, and were often also successful teachers themselves. Think of astrology, phrenology, or alchemy. These were all teachable, although they certainly did not involve any real expertise. On closer inspection, proponents of the teachability criterion face the following dilemma: One might assume that the measure of teachability is that a pupil starts in ignorance about the field and ends up with *genuine* knowledge and understanding as a result of being taught. In that case, teachability may be a reliable indicator of expertise. However, it is then doubtful that laypeople can identify whether some view is teachable. Alternatively, one might assume that teachability only requires that a pupil starts in ignorance and ends up with *putative* knowledge and *putative* understanding after having been taught. In that case, laypeople clearly can identify whether someone is a successful teacher. However, this will not reliably indicate that the successful performers are genuine experts.

Let us now move on to the criterion of **reputation** (D). In the literature, a good reputation among relevant experts has been widely acknowledged as a reliable indicator of expertise. One’s reputation may consist either in appraisal of one’s general achievements, or in acceptance of one’s specific view.[[14]](#footnote-14) The former can be measured by certificates or institutional affiliations (e.g. holding a master’s degree, having a PhD, being university professor, being the director of a research center), awards or the impact factor (the average number of citations that someone’s scientific articles have received). The latter is typically reflected by agreement or peer review selection.

Before starting to assess the suitability of these features as indicators of expertise, it is important to recognize that what matters is not only whether someone is an expert, but also whether her target judgment is a manifestation of expertise. That these two things can come apart can be illustrated by an expert whose specific judgment is influenced either by vested interests or bias. Certificates, awards and high impact factors primarily reflect expertise in the past. However, someone who possessed relevant expertise in the past might not possess it any longer. This is illustrated by renowned scientists who later in their careers (or after retirement) hold crackpot theories.[[15]](#footnote-15) Moreover, a high impact factor might not even reflect expertise within the measured period, since controversial papers and survey articles tend to be cited particularly frequently. If someone’s paper is accepted through a peer review procedure, this is also not a reliable indicator of reliability or truth. For acceptance by a peer does not necessarily indicate agreement. Peers typically accept papers that they take to be important and well-argued or evidence-based. But these papers may neither be true nor reliably produced.

The only remaining putative indicator is agreement with other (relevant) experts. If someone’s view is accepted by most or all relevant experts, then it is highly likely that this view is true and a manifestation of expertise. Consensus is a reliable indicator of truth only if each of the interlocutors is sufficiently reliable and their judgments are mutually independent (Goldman 2001: 103).[[16]](#footnote-16) But these conditions of qualified agreement are typically satisfied by experts. Expert consensus concerning views that are explicitly based on evidence, arguments and a corresponding methodology also indicates that these views are competently produced. We have therefore found a reliable indicator of expert judgment that has a general range of application. Whereas track record is strongly limited to predictive sciences, agreement can be found in every discipline. It is therefore unsurprising that the general praise of expert agreement is an excellent criterion of truth and superior expert judgment.[[17]](#footnote-17)

There is, however, a remaining problem with the criterion of agreement. It is obvious that agreement *with experts* cannot be a basic criterion of expert identification. But we cannot drop the qualification ‘with experts’ either, since without it agreement is not a reliable indicator of expertise and truth.[[18]](#footnote-18) As long as people have further criteria for expert identification, as experts themselves have (e.g. calibration and track record), expert agreement can be used to identify who is better among conflicting experts. If there is, e.g., widespread agreement among climate scientists that climate change is significantly caused by human CO2-emission, then we should side with these scientists against the climate skeptics. But what about laypeople? They seem to lack any further criterion for expert identification, because they can use neither calibration nor track record. Even the latter is typically accessible only to experts. So, if laypeople use the criterion of agreement, they face a problem of circularity. In order to use this criterion, they must already know who is an expert.

The upshot is that laypeople can only identify experts if they possess a criterion over and above expert agreement. None of the previously considered indicators is suitable. But there is another. Laypeople can recognize experts, in a minimal sense, as those who are **selected by the procedural standards of science** (E). Under good conditions, science selects its members according to the following standards:

1. Only trained and/or talented people can become members.
2. Science is open to diversity (no position, identity, or method is excluded).
3. There is strong and open competition between members of the scientific community.
4. Critical thinking, rigor, commitment, and focus are rewarded.
5. Scientific research is guided by the aims of truth, self-control and intellectual integrity (aiming at independence from external standards, external motivation and bias).
6. The ruling standard is scientific agreement among independent judgers.

When science functions properly and selects members of the scientific community in accordance with these standards, it is highly likely that genuine experts will be selected. It also seems likely that laypeople know about this peculiarity of science. Under these conditions, the consensus view among scientists represents the most competent expert view. Hence laypeople are guided by a combination of two criteria. The basic criterion of minimal expertise is being a member of the scientific community. The best expert judgment will then be identified by the further criterion of agreement among scientists.

One caveat must be added. Suppose that science only selects minimal experts as its members when it is working properly. It may still select grossly incompetent people if it is not working properly. So why should laypeople generally accept members of the scientific community as minimal experts? The answer is that they should regard these people as minimal experts only defeasibly. As soon as they discover (perhaps with the help of journalists) that one of the standards of proper scientific practice has been violated, they are no longer justified in regarding them as experts. They may, e.g., find out that the scientific practice is not open to diversity (as with Nazi Germany’s physics and race theory, and as with Lysenkoism); they may find out that scientific competition is restricted in certain ways, that integrity is threatened by fraud, or that science fails to meet its own standards in other ways. In any of these cases, laypeople should no longer follow the scientists’ lead.

Let me summarize the results of sections 1 and 2. Experts are people who possess more evidence and have better reasoning skills in their domain of expertise than the majority. On the basis of these resources, they are sufficiently competent in their judgments about this domain. These features of experts can explain why laypeople should treat them as epistemic authorities in their domain, and why they should follow their lead. When laypeople want to find out who is an expert and who is the better expert, they must first rely on trust in science as an institution for selecting minimal experts. Within science, (a large) consensus indicates a leading expert judgment. Any other criterion of experts is only of marginal value for laypeople.

*3. An application*

In this final section, I will show how laypeople can identify the superior expert in relation to real-life controversies. I will address a recent controversy over the harmfulness of nitrogen oxide that took place in Germany in 2019.[[19]](#footnote-19) Here is the relevant political background: The current WHO guideline for the permissible maximum amount of nitrogen oxide is 40 micrograms per cubic meter. Within the EU, this limit is legally binding. This is why urban driving bans of diesel cars were discussed in Germany in 2018. At the end of 2018, the German Society for Pneumology published a position paper. Relying on a meta-analysis of 400 scientific papers, it argued that nitrogen oxides even below the official limit are harmful to elderly and ill people. This paper provoked the publication of a reply by the chest specialist Dieter Köhler.[[20]](#footnote-20) Co-signed by 113 other people, mostly medical doctors, the latter paper argued that the alleged toxic effects of minor breaches of the limit are refuted by common sense. Otherwise, regular smokers who are exposed to a million times higher concentration of nitrogen oxide would die within a few months. Köhler claimed that the epidemiological studies had made a simple mistake by confusing correlation with causation. Subsequently, this controversy gained public attention and made its way onto TV talk shows. On January 27, 2019 Dieter Köhler met the epidemiologist Heinz-Erich Wiechmann on the Anne Will TV talk show.[[21]](#footnote-21) On this show, the audience saw two putative experts confronting each other. The two could not have been more different. Whereas Köhler was quick-witted, trenchant and had common sense on his side, Wiechmann argued awkwardly, citing numbers and referring to countless studies. As the media pointed out the next day, the audience was flummoxed. The conflicting experts both had the title of a professor, although Köhler argued slightly more convincingly.

 Who should the laypeople have trusted? Given the results of section 2, dialectical competence and certificates should not play any significant role. However, if they had consulted Wikipedia, the laypeople would have discovered that Köhler and Wiechmann differed greatly in terms of their scientific merits.[[22]](#footnote-22) Whereas Wiechmann is a renowned member of the scientific community, as reflected by his institutional role and his ongoing research on the toxic effects of nitrogen oxides, Köhler is not a member of the relevant scientific community, but is instead a director of a hospital. Köhler published a textbook on pneumology, but has never engaged with research on nitrogen oxide. What is more, Wiechmann’s rather than Köhler’s view on the matter is shared by the overwhelming majority of scientific experts. All of these facts were readily available to the public, and could have easily been discovered by a quick online search on Wikipedia. In fact, the audience was distracted by dialectical competence and the pretense of scientific credentials. What we can learn from this example is that laypeople would do much better to rely on the relevant criteria of expert identification.

**References**

Anderson, Elizabeth 2011. “Democracy, Public Policy, and Lay Assessment of Scientific Testimony”. *Episteme* 8: 144-164.

Coady, David 2006. “When Experts Disagree”. *Episteme* 3: 68-79.

Coady, David 2012. *What to Believe Now. Applying Epistemology to Contemporary Issues.* Malden, MA: Wiley-Blackwell.

Collins, Harry 2014. *Are We All Scientific Experts Now?*, Polity Press.

Constantin and Grundmann 2018. “Epistemic Authority: Preemption Through Source-Sensitive Defeat”. *Synthese* 1-22.

Croce, Michel 2019. “On What it Takes to be an Expert”. *The Philosophical Quarterly* 69: 1-21.

Fricker, Elizabeth 2006. “Testimony and Epistemic Autonomy”. In: Jennifer Lackey & Ernest Sosa (eds.), *The Epistemology of Testimony*, New York: Oxford University Press.

Goldman, Alvin 1984. *Epistemology and Cognition*. Cambridge, MA: Harvard University Press.

Goldman, Alvin 1999. *Knowledge in a Social World*. Oxford: Oxford University Press.

Goldman, Alvin 2001. “Experts: Which Ones Should You Trust”. *Philosophy and Phenomenological Research* 63: 113-131.

Goldman, Alvin 2018. “Expertise”. *Topoi* 37: 3-10.

Hetherington, Stephen 2006. “How to Know (that Knowledge-that is Knowledge-how)”. In: Stephen Hetherington (ed.), *Epistemology Futures*, Oxford: Clarendon Press: 71-94.

Khalifa, Kareem 2013. “Is Understanding Explanatory or Objectual”. *Synthese* 190: 1153-1171.

Kitcher, Philip 1993. *Advancements of Science*. Oxford: Oxford University Press.

Köhler, Dieter 2019. “Stellungnahme zur Gesundheitsgefährdung für Feinstaub und NOX“. https://www.lungenaerzte-im-netz.de/fileadmin/pdf/DGP\_Rundbrief.pdf.

La Barge, Scott 1997. “Socrates and the Recognition of Experts”. *Apeiron* 30: 51-62.

Lackey, Jennifer 2013. “Disagreement and Belief Dependence”. In: David Christensen & Jennifer Lackey (eds.), *The Epistemology of Disagreement*, Oxford: Oxford University Press: 243-268.

Lackey, Jennifer 2018. “Experts and Peer Disagreement”. In: M. Benton, John Hawthorne and Daniel Rabinowitz (eds.), *Knowledge, Belief, and God: New Insights in Religious Epistemology*, Oxford: Oxford University Press: 228-245.

Martini, Carlo 2020. “The Epistemology of Expertise”. In: Miranda Fricker, Peter Graham, David Henderson & N.J.L.L. Pedersen, *The Routledge Handbook of Social Epistemology,* London, New York: Routledge: 115-122.

Oreskes, Naomi 2019. *Why Trust Science?*, Princeton University Press.

Quast, Christian 2018. “Expertise: A Practical Explication”. *Topoi* 37: 11-27.

Scholz, Oliver 2009. “Experts: What They Are and How We Recognize Them: A Discussion of Alvin Goldman’s View”. *Grazer Philosophische Studien* 79: 187-205.

Scholz, Oliver 2018. “Symptoms of Expertise: Knowledge, Understanding and Other Cognitive Goods”. *Topoi 37*: 29-37*.*

Schnabel, Ulrich 2019. “Die Fachleute bleiben unsichtbar“. *ZEIT online*, 6.2.2019. https://www.zeit.de/2019/07/stickoxid-grenzwerte-niederlage-wissenschaft-erkenntnisse-schadstoffe-gesundheit. Accessed on 6/20/2020.

1. Whether the latter is a special kind of the former is an interesting question that I can leave open for this paper. For a reduction of knowledge-that to practical knowledge-how, see Hetherington 2006. [↑](#footnote-ref-1)
2. One might think that there are further species of expertise that have not been considered so far. For example, Goldman 2001 introduces the notion of ‘weak expertise’ to refer to expertise on the literature within some field (p. 92). He also uses the notion of ‘meta-expertise’ to talk about expertise on who is an expert in some field (p. 93) But strictly speaking, these notions just refer to very specific domains of expertise. [↑](#footnote-ref-2)
3. This platitude is somewhat controversial. For example, Lackey 2018 claims that expert judgments have a large evidential weight, rather than satisfying the conditions of epistemic authority. She therefore takes experts to be advisors rather than authorities. [↑](#footnote-ref-3)
4. Although Goldman admits in some passages that something along these lines might be required (Goldman 1999: 268; Goldman 2001: 91), he never elaborates a corresponding definition. [↑](#footnote-ref-4)
5. It is important to understand objectual competence in such a way that it does not require individual virtues that are creditable to the epistemic agent. [↑](#footnote-ref-5)
6. For a defense of a threshold condition, see also Goldman 2018: 4-5. Coady 2012: 28-29 disputes this condition. [↑](#footnote-ref-6)
7. Keep in mind that the term ‘competence’ is used here without reference to any of the epistemic agent’s virtues. [↑](#footnote-ref-7)
8. I owe this expression to Clayton Littlejohn, although it originally comes from ancient Greek. [↑](#footnote-ref-8)
9. Goldman 1999: 23-24 distinguishes between strong knowledge (which involves the epistemologically interesting extra conditions) and weak knowledge (which is identical with true belief). [↑](#footnote-ref-9)
10. See Goldman 1999: 267. [↑](#footnote-ref-10)
11. See Goldman 2001: 89-90. [↑](#footnote-ref-11)
12. Goldman 2001: 95-97 considers this to be ‘direct argumentative justification’. [↑](#footnote-ref-12)
13. It was, of course, Goldman’s brilliant insight that a proposition might change its status from being esoteric to being exoteric over time (Goldman 1999: 268-269, Goldman 2001: 94, 106-107). [↑](#footnote-ref-13)
14. In contrast, Goldman 2001: 93 treats appraisals and agreement as two different categories. [↑](#footnote-ref-14)
15. One particularly striking example is Peter Duesberg, who started as a famous virologist and later disputed that AIDS is a virus infection. [↑](#footnote-ref-15)
16. There are some technical objections to the independence condition that we can ignore for the purposes of this paper, see Coady 2006; Lackey 2013. [↑](#footnote-ref-16)
17. See e.g. Anderson 2011: 149; Oreskes 2019: 128-29. [↑](#footnote-ref-17)
18. This is so because if people are not even minimally reliable, or if they are influenced by strong biases, agreement is an indicator of incompetence and falsity rather than expertise and truth. [↑](#footnote-ref-18)
19. For the following, see Schnabel 2019. [↑](#footnote-ref-19)
20. Köhler 2019. [↑](#footnote-ref-20)
21. See https://www.spiegel.de/kultur/tv/anne-will-ueber-diesel-fahrverbote-grenzwertig-a-1250265.html. [↑](#footnote-ref-21)
22. For Dieter Köhler, see: https://de.wikipedia.org/wiki/Dieter\_K%C3%B6hler\_(Mediziner). Accessed on 6/20/2020; for Heinz-Erich Wiechmann, see: https://de.wikipedia.org/wiki/Heinz-Erich\_Wichmann. Accessed on 6/20/2020. [↑](#footnote-ref-22)