The Elusive Concept of Expertise: Who counts as an expert?

Barbara Gail Montero

Author’s affiliation:
City University of New York

* Corresponding address: bmontero@gc.cuny.edu

ABSTRACT:
There is an ongoing debate in the philosophy and psychology of skill as to the nature of expertise. On the one side of this debate are those who maintain that although novices need to think about, deliberate over, and pay attention to their developing skills, experts perform optimally in the absence of conscious skill-directed attention, while on the other side, are those who maintain that experts generally are consciously engaged in their execution of their skills. What, exactly, do the various proponents of each side of this debate mean by “expert” when they claim that experts either do or do not consciously attend to their movements in action? The aim of this paper is to describe and critically analyze some of the uses of the term “expert” in the expertise literature, along with the criteria that have been employed to identify experts and, ultimately, to suggest a conceptualization of expertise that may facilitate a more productive debate over the question of whether experts think in action.

Introduction
There is an ongoing debate in the philosophy and psychology of skill as to the nature of expertise. On the “automaticity-side” of this debate are those who maintain that although novices need to think about, deliberate over, and pay attention to their developing skills, experts perform optimally in the absence of conscious skill-directed attention (for example, Fitts and Posner 1967; Dreyfus and Dreyfus 1986; Masters 1992; Beilock and Car 2001; Beilock, et al. 2002; Beilock and Gray 2007; Dreyfus 2007, 2014, DeCaro et al. 2011; Jackson et al. 2013). On the “conscious-reflection-side,” are those who maintain that experts generally perform best (or at least no worse) in the presence of such attention, be it fine-grained attention to the movements of specific body parts or more coarse-grained attention to speed, grace, or timing (for example, Collins, Morriss and Trower, 1999; Sutton et al. 2011; MacIntyre et al. 2014; Englert and Oudejans 2014; Toner et al. 2015, 2016; Christensen et al. 2016; Montero 2015, 2016). What accounts for this disagreement about the role of the mind in expert action? No doubt, a large part of the
reason is that the evidence and argumentative support for each side are inconclusive. However, another part of the reason—the part that motivates this article—is that researchers might not be working with the same conceptualizations of what counts as an expert.

What, exactly, do the various proponents of each side of this debate mean by “expert” when they claim that experts either do or do not consciously attend to their movements in action? And, more generally, what does it mean to be an expert? An expert, presumably, is someone with expertise, but what is that? It is likely that different contexts will call for different answers to these questions. And even within contexts, there is no need to start with a strict definition the term “expert,” a definition, that is, that provides necessary and sufficient conditions for being an expert. However, to facilitate a productive debate over the role of the mind in expert action, we need some starting point. And the closer the starting points—that is, the more uniform the usage of the term “expert”—the less likely the different factions of the debate over expertise will be talking past each other. The research presented here takes some preliminary steps (preliminary to a more systematic and empirically grounded investigation into the various ways the term “expert” is employed in the expertise literature) toward the goal of arriving at a conceptualization of expertise that can help forward the debate. To this end, it identifies and critically analyzes six different ways the term has been defined in the expertise literature along with the corresponding the criteria that have been used to identify experts, and, ultimately, suggests a conceptualization of expertise that will, ideally, further the debate over the question of whether experts think in action, further the debate over the nature of expertise.1

The Expert as Someone Who Performs Automatically

If one is researching expert action, one needs a rough idea of what counts as an expert. A full understanding is not necessary. In fact, strictly speaking, if one had a complete understanding of what an expert is, no more research would need to be done. But we need a starting point to begin investigations of expertise. If researchers want to know whether, say, expert athletes have faster reflexes than amateur athletes, who ought they to test? One answer—found in both the philosophy and the psychology literature—to this question is that an expert is an individual who has developed her skills to the point where they have become effortless and automatic, where an automatic skill is seen as skill that proceeds with little effort and little, if any, conscious attention and conscious control (Beilock & Carr (2001). This understanding of expertise as the ability to perform actions automatically may be behind Guthrie’s (1952) classic definition of expert skill as “the ability to bring about some end results with maximum certainty and minimum outlay of energy, or of time and energy” (p. 136). Guthrie, however, instead might have meant that an expert uses energy efficiently not that she uses less of it (136). Nonetheless, this conceptualization of expertise is clearly borne out in the accounts of skill acquisition proposed by Hubert Dreyfus and Stuart Dreyfus (1986; 2004) and Fitts and Posner (1967) whereby experts proceed without awareness of their actions. And it is also

1 This work is a development of ideas explored in Montero (2016).
expressed in Wulf and Lewthwaite's (2010) comment that “relative effortlessness is a defining characteristic of [expert] motor skill” (p. 75).

Defining expertise in terms of automaticity, or the relative effortlessness that accompanies automaticity, may be useful in certain contexts. However, it cannot be the starting point for a debate over the nature of expertise, that is, for a debate over whether expert action is effortless and automatic or, instead, more thoughtful and effortful. If the automaticity-side of the debate prevails, it will be the end point; but it ought not to be the entry. And, since finding a starting point for that debate is our current goal, let us move on to the concept.

**Accumulation of Knowledge Account**

According to the “accumulation of knowledge” understanding of an expert, experts are those who have accumulated extensive knowledge about a specific domain: a grandmaster chess player knows over one thousand openings, an expert cardiologist has amassed a great store of knowledge about medical problems related to the heart and the treatment thereof, and an expert on the history of the Spanish conquest of Mexico may know, among other things, by what percentage the native population decreased in Mesoamerica from the early sixteenth century to the middle of the seventeenth century, which diseases were transmitted by the Europeans, as well as the form of taxation imposed on and labor demanded of the natives. On this view of expertise, as the psychologist Earl Hunt (2006) puts it, the idea of “an ignorant expert would be an oxymoron” (p. 31).

Such an understanding of expertise might, at first glance seem to fall into a similar problem as the automaticity concept, but from the other direction: if the debate over the nature of expertise is a debate over whether experts proceed thoughtfully, with knowledge of what they are doing or, instead, more automatically, this ruling decides the issue in favor of the conscious-reflection-side, and thus cannot serve as a starting point of investigation. However, if we define an expert as one who has accumulated knowledge, it doesn’t necessarily follow that such knowledge is conscious when experts enact their skills. So, we do not need to reject it for the reason that it prejudices the debate in favor of one side. However, as we shall see, there are some other objections to this view.

Although experts often do seem to have copious amounts of knowledge about some topic, it is not clear that knowledge alone can be used to draw the line between the haves and the have-nots. Alvin Goldman (2001), for example, argues that expertise—not just in physical endeavors, but even in the cognitive realm (such as academic scholarship) where one might think that this understanding is most at home—is not just the possession of information but comprises various skills or techniques. Goldman distinguishes what he calls “an objective sense of expertise,” which is “what it is to be an expert,” from a “reputational” sense of expertise, which is what it is “to have a reputation for expertise” (p. 91). Since, for Goldman, “a reputational expert is someone widely believed to be an expert (in the objective sense)” (p. 91), the basic question, for him, is: What is it to be an expert in the objective sense? On his view, experts (in the objective sense) possess not only large amounts of information relevant to their domain of expertise but also have “the (cognitive) know-how, when presented with
a new question in the domain, to go to the right sectors of [their] information-banks and perform appropriate operations on this information; or to deploy some external apparatus or data-banks to disclose relevant material” (pp. 91–2).

One might ask whether such know-how is not simply part of what it is to possess the information about a topic or to have knowledge of something. If you say you have extensive knowledge of Edmund Spenser’s The Faerie Queene, and someone asks you what virtue the character Britomart represents, you had better be able to access the information you have that provides the answer, else your claim to knowledge will sound like an empty boast. Other examples, however, suggest that expertise is not merely superior knowledge. Outstanding chess players, for example, not only have knowledge in abundance, but they seem to have (or have developed) amazing cognitive abilities that allow them to excel, such as the ability to follow through long chains of chess moves. Because of the importance of such abilities, two people might in some sense possess the same knowledge about chess yet differ as to whether we would want to call them expert chess players (see also Fridland 2012 and Williams 2008).

Although Goldman explicitly restricts his inquiry into what counts as an expert to the domain of cognitive expertise, the shortcomings of the ‘mere accumulation of knowledge’ definition of expertise may be more apparent in the arena of bodily expert endeavors. For example, one can know quite a bit about performing a gymnastics routine on the balance beam, yet not be able to do it even if one’s life depended on it. And having that ability to perform the routine, some will say, is essential to our concept of expertise. Then, again, others might question this application of the term “expert”: sure, one might object, a gymnast might be able to perform on a balance beam but unless she also has extensive knowledge of balance-beam technique, she is not an expert; an expert even with physical skills is just one who possesses extensive knowledge in an area. On this way of thinking about expertise, at a boxing match, the old coach in the ring, unable to throw a punch anymore, is the only expert in the ring since he is able to impart his great store of information to the boxer. Then again, others will say that the coach is an expert at boxing theory while the boxer is an expert boxer. That the term “expert” is multivocal in this way, highlights a difficulty of providing a necessary and sufficient condition for being an expert tout court: ordinary language permits many understandings of expertise that are useful in particular contexts. The goal here, however, is not to define “expert” tout court, but rather is to identify a meaning of “expertise,” that is useful in the context of the debate over the nature of expertise.

Another route to defending the accumulation-of-knowledge definition of expertise might begin by asking whether we can even properly distinguish knowledge from skill. This is a key question in the literature on skill or “know-how,” which some might see as a broader category than expertise, as it spans the spectrum from the highly trained skills of a ballerina to those of a toddler riding a tricycle. Jason Stanley and John Krakauer (2013) argue that skills at a minimum require some conceptual knowledge

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2 The phrase “expert chess players,” is not intended to refer to the United States Chess Federation’s (USCF) title, Expert, given to players with a USCF rating from 2000–2199.
about how enacting the skill is begun, or in other words, know-how requires “knowledge that.” For example, if you have the ability to hit a baseball, you will at least know that you need to pick up the bat. And Carlotta Pavese (2015) goes even further, arguing that skill is just knowledge. Of course, whether skill is or can be grounded in knowledge depends a great deal on what counts as knowledge. For example, must knowledge (that something is the case), be expressible in words? It seems that someone might be able to ride a bike without being able to say much about how they do so. However, as Stanley (2011) argues, it is not at all clear in thinking about this issue what is to count as expressible in words. For example, I can say, “riding a bike is like this,” where the “this” refers to the way I ride a bike. Have I thereby fully expressed my skill in words?

It is unclear how to answer question. However, even assuming that knowing how to do something amounts to knowing certain facts, even assuming that skill can be entirely reduced to knowledge of certain facts, one still wants to know how much knowledge is necessary to reach the level of expert skill. Goldman (2001) thinks that when someone is an expert in an objective sense, this individual possesses superior knowledge; and it is not just superior relative to others but superior from something like a “God’s eye point of view” (p. 91). Yet how are we to attain a God’s eye point of view? For researchers who need to identify subjects who count as experts, obtaining a God’s eye point of view may not be a practical solution.

Peer Nominations and Reputation

Perhaps rather than asking God, as it were, who the experts are, researchers can turn to peer nominations and the identified reputation of contenders for the designation “expert.” To translate this approach to identifying experts into a definition of what counts as an expert, one could say an expert in a domain is someone who is recognized by peers and/or has a reputation for being an expert in that domain.

This definition of “expert” is similar to George Dickie’s (1969) “institutional definition of art,” according to which something counts as art as long as it is acknowledged as such by the appropriate members of the art world. Of course, institutional definitions of art have been criticized (see, for example, Carroll 1994), yet it is interesting to note that the Wikipedia entry for expertise begins by telling us that an expert is “someone widely recognized as a reliable source of technique of skill whose faculty for judging or deciding rights, justly, or wisely is accorded authority and status by peers or the public.”

Peer nominations in the research on expertise, though not often employed to define what it means to be an expert, are not infrequently used to identifying experts. Obtaining peers’ judgments about who counts as an expert is much easier than obtaining a God’s eye point of view, yet the accuracy of this method of identification has been questioned. A number of studies indicate that peers are not good judges of expertise. For example, research by Shanteau (1988) shows that peers might be unduly influenced by others “outward signs of extreme self-confidence” (p. 211). And a study by Elstein and colleagues (1978) indicates that diagnostic skills were no better in a group
of physicians who were identified by peers as outstanding compared to a group of undistinguished physicians. To be sure, much depends on what standards are being used to determine that peer nominations are not an accurate way of identifying experts. Is it, for example, that the doctors identified by peers as outstanding had no better mortality rates in their patients and if this were so, why should that be the criterion for expertise in physicians (perhaps certain physicians treat only high-risk patients)?

Another question is, “who is to count as a peer”? To say that peers are other experts does not help unless we already know who the experts are. Perhaps sometimes we can identify peers as others in the same discipline. But do peers generally have insight into their colleagues’ prowess? A retrospective analysis of their research into diagnostic performance by Elstein and colleagues (1990) suggests that in medicine, at least, they don’t. And the explanation Elstein and colleagues proffer is that because doctors typically aren’t patients of very many other doctors, there is little reason to think that they would be able to make accurate judgments of their peers’ diagnostic abilities. In other disciplines, this might not be such a problem. Philosophers, for example, are all each other’s patients, inasmuch as we read the work of quite a number of other philosophers, and thus we have ample opportunity to judge peers’ work. Though, Shanteau’s (1988) conclusions might lead us to not place too much weight on such judgments.

Perhaps we need not to look at peers to identify experts, but general societal standards, that is, to reputation; if a person is deemed a doctor in the standard way (e.g. she’s been awarded an MD, passed the boards etc.), then, one might argue, we have a medical expert. For a finer slice of the population, some may appeal to prizes to identify experts. How does the attainment of a degree or a prize faire as a definition or a criterion for identification of expertise? Some of the problems of peer nominations return (after all, prize winners may be chosen by peers). And one might want to avoid standards that are either too lenient (right after getting a PhD are you an expert in the field?) or too strict (if large scale studies are to occur, one will need to hold that there are more experts in physics, for example, than those who have won Nobel prizes). In general, peer nominations for being an expert are typically used to identify the crème of what might otherwise be thought of as an expert crop, and, although this may be useful in certain contexts, most of the participants in the debate over expertise are looking for a broader criterion.

**Domain-Related Experience**

Can expertise be determined by extensive practice (or determined by a combination of extensive practice and reputation, as in Micheline Chi et al. 1988)? One advantage of such a criterion is that it is relatively straightforward to measure how many years someone has spent practicing a skill. Although there may still be questions about exactly when the extensive practice began and just how extensive it has been, the idea that experts are those who have practiced their endeavors for a certain number of years is comparatively objective.

Ericsson (2006, 2008) rejects this approach since, as he points out, there are “numerous empirical examples . . . [of] ‘experts’ with extensive experience and extended education . . . unable to make better decisions than their less skilled peers or even sometimes than their secretaries” (2008, p. 989).
These examples in part ground Ericsson’s view that it is not merely experience but experience combined with practice focusing on improving that leads to excellence (for the studies he cites often concern activities which do not typically involve much performance feedback so offer little room to improve). For example, research by Reif and Allen (1992) shows that physics professors at University of California, Berkeley, despite their long years of experience, are not significantly better at solving introductory physics problems than their students (though, this leaves open the possibility that they are much better at explaining them). And as Ericsson points out, there are many other examples of skills that do not seem to get better based on mere experience. For example, after an initial learning phase, habitual actions such as walking or stair climbing are apparently like this as well.

Does the fact that certain skills fail to improve mean that they cannot be counted as expert skills? Not necessarily, since for certain purposes, one might want to count such skills as expert skills. However, in the debate over the nature of expertise, those who maintain that expert action is thoughtful and effortful do not want such skills to count as expert skills. And if the debate is to be productive, we need a starting point that satisfies both sides.

Reproducibly Superior Performance

In response to perceived problems with the prior definitions of what it is to be an expert based on peer nominations and domain-related experience, Ericsson has come to understand the notion of what it is to be an expert in terms of reproducibly superior performance (Ericsson, Prietula, & Cokely 2007). For example, he tells us that “chess masters will almost always win chess games against recreational chess players in chess tournaments, medical specialists are far more likely to diagnose a disease correctly than advanced medical students, and professional musicians can perform pieces of music in a manner that is unattainable for less skilled musicians” (Ericsson 2006, p. 3). Experts, on this understanding of the term, are, in their domain of expertise, a cut above the rest of us, and consistently so.

Yet what is superior performance? Ericsson is not looking for a God’s eye point of view, but rather for a relative one: an expert’s performance, for him, is “at least two standard deviations above the mean level in the population” (Ericsson and Charness 1994, p. 731). On this definition, if your skill is two standard deviations above the mean (that is, better than approximately 97.725 percent of the population at a task), you are an expert at it. One might quibble that any criterion that draws a sharp line is ultimately unlikely to be satisfactory. The difference between being in the 97.72 percentile and 97.73 percentile should not make or break an expert. So the line needs to be fuzzy: it is not that one turns into an expert when one’s abilities are at least two standard deviations above the mean, but rather that expertise occurs when one’s abilities are around more than two standard deviations above the mean. Assuming that performance is measurable with quantitative data, this seems to be a simple fix, but it is not a complete one.

In defining expertise relative to the ability of others, we need to specify the population of comparison. Presumably, we do not want to end up saying that Olympic marathon runners of the distant past were not experts because many of today’s serious amateur runners are comparatively faster; thus, it
seems that the comparison class should be contemporaries. But does this mean that the comparison class should be the entire living population? It might not be very difficult to be in roughly the top percentile in an activity in which few perform. For example, since the vast majority of the world’s population does not ice skate at all, having tried to ice skate for simply a few hours might place you in the 99th percentile. Perhaps one way around this would be to raise the bar for ice skating and other uncommon skills, and lower it for more widely practiced skills, such as running. However, we then need a prior criterion of expertise that tells us how high the bar should be for each activity.

Instead of making expertise relative to the entire population, should the comparison class be only those who have engaged in the activity? If we were to do this, then we could take the expert ice skaters to be those that are two standard deviations above the mean with respect to ice skaters, which would lead to better results for skills in which ability is normally distributed. But how does this approach account for situations where there are extreme outliers? Imagine that the skills of chess players are distributed along a bell curve, so that a small group of players are really good at chess. With the two-standard-deviations-above-the-mean criterion, such players count as experts. Now imagine that a chess super genius is born who was steeped in chess basically from birth, the result being that her ability soars so far beyond everyone else’s that even the grandmasters are no longer two standard deviations above the mean. Have they ceased to be experts?

Here’s a real-life example that, depending on how you look at it, either brings out another possible problem with this approach or offers a defense of it. A nursing doctoral student once explained a new technique, the “body-cooling technique,” was introduced at her hospital to help infants who have reduced levels of oxygen in their brains. She was the first one to learn it. Right away, even after she had tried it only once, she became the floor “expert” on body cooling. Here natural language supports a relativistic view of expertise: she was likely better at the technique than 98 percent of the other nurses on her floor and her ability may have been two standard deviations above the mean. But did this suffice to make her an expert even on her floor? Maybe, but she at least did not feel comfortable with the appellation.

A related problem arises in situations where everyone who does a certain activity is, we would want to naturally say, very good at it. For example, perhaps because period musical instruments are so expensive, most everyone who makes the investment is determined to work hard at playing them, leading to extraordinary prowess. If our comparison class is the general population, we do end up with all of these great period instrumentalists residing at the uppermost percentile of ability. However, if our comparison class is those who play these instruments, this standard would count the vast majority of such musicians as non-experts. And, just as students in an honors class hate grading on the curve, such musicians would likely balk at curving the concept of expertise in this way as well.

Furthermore, this relativistic criterion does not necessarily exclude everyday skills. Perhaps if people were tested on some sort of time and accuracy trial of shirt-buttoning (how many buttons can you fully fasten in five minutes) we would find a normal distribution with some people emerging in the
top 99 percent, yet for the purposes of arguing that thought in action is compatible with expert action, one does not want the ordinary shirt-buttoner to count as an expert, if this ordinary shirt-buttoner is someone who proceeds by habit, yet just happens to have gotten better at it than most. In other words, this relativistic criterion could end up unduly favoring one side of the debate over the nature of expertise: those who see expertise as automatic.

Beyond this, on a relativistic criterion, we may be led to count people who have natural extreme abilities as experts. For example, there are savants who, with apparently no practice or training, can tell you what day of the week any calendar date lands on. With what is called “acquired savant syndrome,” such abilities might even manifest themselves only after a head injury (Treffert 2013). Savant calendar calculators are certainly in the top 99 percent of the general population in terms of this skill. And in a good sense of the term, they are expert calendar calculators. Yet such a result may also not satisfy researchers on both sides of the debate over the nature of expertise.

Apart from all this, is the question of how to determine whether someone falls into the top percentile of ability? In certain realms, such as the world of tournament chess, there are clear standards as to what counts as superior performance—roughly speaking, if one player is able to consistently beat another player, the one counts as superior to the other. However, even here, there is some uncertainty. For example, occasionally researchers on chess expertise take a chess player’s ability to choose the better move (determined by a computer analysis) from a difficult position as indicative of better skill and while these might seem to offer forth the same results, however, someone who gets extremely nervous during tournament games might perform poorly during games yet nonetheless be able to select winning moves during a psychology test. And, though widely accepted, some have questioned about the accuracy of the rating system (Moul and Nye 2006). In typing, speed and accuracy have traditionally been identified as criteria by which we can judge expertise, but there is still the question of how much weight to place on speed and how much on accuracy. Other areas are more subjective. There is no direct test of mastery that can weed out the expert abstract expressionist painter from the novice. And there is no set of questions one can ask of individuals with philosophy training such that, if answered correctly, some of these individuals are revealed as experts. It is often more how they say it rather than what they say that matters, yet the how is less objective than the what (a fact that drives college assessment committees crazy).

Ericsson (2008) would ideally like for all expert performance to be quantitatively measurable. And he points out that in addition to Olympic standards for athletic events, “more recently, there have emerged competitions in music, dance and chess that have objective performance measures to identify the winners” (p. 989). There is even such a thing as a philosophy slam competition. Such competitions are not even recent inventions; during Roman Em-
Imператор Nero’s time (CE 67), competitive poetry reading was on the list of Olympic events. Yet do such competitions accurately identify experts?

The violinist Arnold Steinhardt, who himself won the Leventritt International Violin competition, sees competitions in music like this:

You were a nag in a horse race with a number on your back. There’s nothing wrong with a real horse race—the first one across the finish line wins—but how does one judge a musical entrant in a competition? By how fast he plays, how few mistakes he makes? How does one grade beauty, after all? . . . The winners often triumph because of what they didn’t do: they didn’t play out of tune, they didn’t play wrong notes, that didn’t scratch, that didn’t do anything offensive. Contestants who commit these sins are quickly voted out, but they may be the ones to turn a beautiful phrase and play with great abandon, the ones who reach out to the listener’s heart and mind (Steinhardt 1998: 37)

Finally, one might ask whether laboratory performance is indicative of the level of skill that an individual has attained. If a chess player can make superb moves when asked to choose the best move in a laboratory setting, yet wilts under pressure during a game, is she an expert? A researcher might calibrate subjects’ level of golf expertise by looking at a golfer’s ability to make a putt in the lab. But if someone performs spectacularly in the lab, yet abysmally during actual games because of performance anxiety, is this person still an expert? It is difficult to know how to answer such questions, but it is interesting to note that in some arenas, performance in the field is all that matters: for example, if a surgeon frequently gets nervous in the operating room so much so that her hands shake and she cannot perform her job well, presumably she is not an expert surgeon. With musicians, however, we might allow someone with severe performance anxiety, to count as an expert based on recordings. And related to this, there are some arenas which ban the use of beta blockers, such as the Olympics, while in others, such as competitions in music, they are permitted. Does expertise in Olympic rifle shooting but not in music encompass an ability to control nerves? Regardless of what the answer to this question is, the fact that it is a question indicates that judging whether someone is an expert based on whether they perform in a “superior” manner, is no easy task.

The Expert as a Quick Study

Ericsson (2008) also mentions that “it is part of the definition of an expert performer that they are able to perform at virtually any time with relatively limited preparation” (p. 989). However, although an emergency room nurse must be ready to act when the call comes in, it is arguable that sometimes the need to prepare for extended hours is irrelevant to whether we should withhold the honorific “expert” from that individual. If in getting ready to give a speech, let us say, one speaker must prepare for weeks and another just a day, it seems that the individual with the longer preparation should not necessarily be judged as an in-expert speaker, especially if it was widely agreed that her speech was outstanding. In the psychology of expertise, a musician’s ability is sometimes determined by a test of how accurately an individual can play a
piece without any preparation. But, given that musicians usually have time and take time to prepare for their performances, it is at least not obvious that this should matter.

Sometimes it is not the ability to prepare quickly, but rather one’s raw speed in action that is seen as indicative of expert action. However, unless the action itself is one that requires speed, it is again not clear that this is a reasonable criterion. Imagine that two news writers have assignments that are due daily at midnight. And for the past ten years, one typically takes around eight hours to complete the assignment—and, at least based on her first-person experience of her job, has typically felt as if she needed this amount of time—while the other typically pulls it off in a couple hours. If the quality of the final output is the same, is there any reason to think that the quicker one is the expert writer, and the other one is not? Leonard Cohen took at least four years, he claims, to write the song ‘Hallelujah’. And it wasn’t easy for him: “I remember being in the Royalton Hotel on the carpet in my underwear, banging my head on the floor and saying, ‘I can’t finish this song’” (Light 2012, p. 3). Does this disqualify him from being an expert songwriter? The answer to this question suggests that we have again hit upon a less than optimal definition of expertise for our purposes.

**Deliberate Practice and the Desire to Improve**

We have now canvassed definitions of expertise in terms of automaticity, accumulation of knowledge, peer nominations, domain-related experience, reproducible superior performance, ability to perform with limited preparation, and performance speed and have found that none of them are quite right for a starting point for those engaged in the debate over whether on the one hand, experts consciously reflect on their actions as they unfold or, on the other hand, experts proceed more or less automatically, without conscious thought. What, then, would be useful way for to understand “expert” in the context of this debate? Yarrow et al. (2009) explain that one can conceive of an expert as “a person who has had the motivation to practice one thing far more than most people could endure” (p. 588). And if the practice in question here is not mindless repetition, but activities done with the deliberate intent to improve, it may be that we have arrived at what we need: experts are individuals who have engaged in around ten or more years of deliberate practice, which means close to daily, extended practice with the specific aim of improving. Further restriction may be useful in approaching research on expertise. For example, the group of subjects being investigated may be those who not only have engaged in deliberate practice, but are still engaging in it. The hypothesis being tendered, however, is that one productive starting point for researchers studying the nature of expertise is the idea that experts are those who have engaged in around ten or more years of deliberate practice (and are still practicing in a deliberate manner).

This conceptualization of expertise is similar to Bereiter and Scardamalia’s (1993) view that expertise is not a static stage to be attained, but the continual striving to improve. Bereiter and Scardamalia’s (1993) view was inspired by studying writers, and it contrasts with the conventional view of expertise as effortless:

Conventional wisdom sees experts doing quickly and easily what novices do laboriously, if they can do it
at all. Novices have to reason things out, whereas experts know what to do without thinking. [Yet] the paragons of effortless performance were fifth-graders who, given a simple topic, would start writing in seconds and would produce copy as fast as their little fingers could move the pencil (pp. 2–3).

And simply doing more mindless practice, according to Bereiter and Scardamalia, will not lead these children to expertise; rather, as they put it, “for many, the effect of years of practice is simply [the ability] to produce increasingly fluent bad writing”(2). The expert, for Bereiter and Scardamalia, is one who, through an ongoing practice of learning, continues to develop.

Although Ericsson’s understanding of expertise does not incorporate the ideal of deliberate practice, his research supports the idea that experts have not only practiced for at least around ten years, but that they have engaged in deliberate practice for this time. The view that in order to become an expert at any endeavor it takes at least around ten years (the so-called “ten-year rule”) has been known for a long time. It was perhaps first formulated by Bryan and Harter (1899), and although there may be some exceptions, it does seem that in many domains—such as sports, music composition, science, and chess—ten years does turn out to be the minimum necessary number of years it takes to reach professional status. And the general idea is, of course, much older: when the Ancient Greek physician Hippocrates said “art is long” he was referring to the length of time it takes to develop expertise. But it takes more than just putting in the hours. As Ericsson and colleagues (1993) have documented, those who excel in a wide variety of fields have not only engaged in ten years of practice, but have engaged in ten years of deliberate practice—that is, not mindless practice that involves doing the actions over and over again, as might be true of our daily activities such as buttoning a shirt or driving to the office, but rather practice that involves working on aspects that are difficult and, after practice, analyzing one’s own successes and failures. Apart from the modicum of studying drivers do in order to renew their licenses, most everyday drivers don’t aim to hone their skills (that is, if the studying for the driver’s test is to count as skill-building at all)

That experts analyze their mistakes as well as their correct actions is well illustrated in high-level chess, where it is de rigueur for players to carry out postgame analyses of how well they played. Compare this to Dreyfus’s (2013) view that “in all domains, masters learn primarily not from analyzing their successes and failures but from the results of hundreds of thousands of actions” (p. 35). No doubt, those hundreds of thousands of actions are important, but so is the analyzing.

The idea of practice, however, is sometimes contrasted with performance, yet not all experts perform (in the sense that a dancer or musician performs). For example, in philosophy, although we give talks, it is not as if all our work is leading up to the talk; indeed, the talk is often given in order to help improve an article or book in progress. Similarly, a painter does not work on a painting with the end of a performance in sight (though there are painters who paint as a performing art). Nevertheless, there is a sense of the term “practice” according to which a painter can spend ten years practicing (that is, doing) her craft, whether she ever performs or not. Deliberate practice, in
this sense, covers any type of activity that is done with an aim, at least in part, to improve, or to learn, or figure something out. This covers not only what we would call a period of training (for example, either in graduate school or in art school, respectively), but also the actions that such non-performing experts engage in when they are trying to get better at their craft.

Here is a proposal: those who are engaged in the debate over the nature of expertise think of experts as individuals who have practiced their endeavors, with the intent to improve, for at least around ten years and, furthermore, are still engaged in deliberate practice. Ongoing deliberate practice is something that proponents of the conscious-reflection side of the debate would want to maintain, since without it, we could have individuals counting as “experts,” who after a long successful career are now content to sit on their laurels, and such individuals would be more likely than those who are still engaged in deliberate practice to perform automatically. Proponents of the automaticity side of the debate over the nature of expertise, of course, sometimes have a broader meaning in mind. Dreyfus and Dreyfus (1986), for example, explicitly include everyday skills under the banner of expert skills. However, the understanding of expertise that has been put forth here seems to lie at the intersection of the sets of individuals that proponents on both the automaticity-side and the conscious-reflection side of the debate counts as experts. Thus, it may be that a useful starting point in the debate over the nature of expertise is one that understands experts as those who have deliberately practiced a skill for at least around ten years and are still engaged in deliberate practice of that skill. These are the sorts of individuals that the disagreement over the nature of expertise turns on: proponents of the automaticity side of the debate maintain that such individuals (as well as others) perform automatically while proponents of the conscious-reflection side of the debate maintain that such individuals perform with conscious attention and control.

Conclusion

One way to understand the concept of being an expert is to understand experts as those who have deliberately practiced their skills for at least around ten years and are still doing so. And the suggestion that has been put forth here is that this concept of expertise would be useful researchers engaged in the debate over the nature of expertise, that is, the debate over whether experts perform optimally in the absence of conscious skill-directed attention. This understanding, however, may very well not be helpful to other areas of research into expertise. For example, in his quest to understand what goes into making an expert, Ericsson needs an independent criterion for what counts as an expert. That is, he cannot define an expert as someone who is engaged in deliberate practice and then go on to find that experts engage in deliberate practice. Thus, the definition proposed here will be of little use for his endeavor. However, the conceptualization of expertise proffered here is intended to be of use to researchers who are investigating not what goes into making an expert, but rather what goes on in the mind of the expert in action; those engaged in this debate can, without circularity, simply co-opt Ericsson’s findings and build them into a definition of expertise. Those engaged in that debate can understand experts as those who have engaged in around ten or more years of deliberate practice and
are still passionate about improving. Or as Albert Einstein (1915/1998) put it, experts are forever working on goals that they can only barely achieve through their greatest efforts.

References


