The Skill of Imagination

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Abstract: We often talk of people as being more or less imaginative than one another – as being *better* or *worse* at imagining – and we also compare various feats of imagination to one another in terms of how *easy* or *hard* they are. Facts such as these might be taken to suggest that imagination is often implicitly understood as a skill. This implicit understanding, however, has rarely (if ever) been made explicit in the philosophical literature. Such is the task of this chapter. I first attempt to flesh out several conditions for an activity to count as a skill. I then attempt to show how imagination can meet such conditions. The chapter concludes with an attempt to answer various worries that might be raised to the claim that imagination should be thought of as a skill.

In a memorable scene from the 1984 film *Amadeus*, Mozart imperiously dictates various instructions to Salieri while at work composing The Requiem. But Salieri cannot easily follow Mozart's instructions. Why not? As the film depicts things, it seems that Mozart's powers of musical imagination far outrun those of Salieri. Salieri simply can't imagine the music as well as Mozart can; Mozart can hear the music in his head in a way that Salieri cannot.[1]

In ordinary life, as in film, we generally accept the claim that imaginative abilities vary from one person to the next. We accept that some people are better at imagining than others – whether it's auditory imagining, as in the case from *Amadeus*, or some other kind of imagining, as in many other cases. On this folk view of imagination, imagination is viewed as a skill.

Of course, folk views are notoriously problematic in all sorts of respects, but when it comes to imagination, I think we find at least one instance in which the folk have got things right. Imagination is indeed a skill. Unfortunately, this pre-theoretical insight about imagination seems to have been largely lost in the contemporary philosophical investigation of imagination. Amid the explosion of philosophical interest in imagination in the last three or four decades, while we can find occasional passing references to the fact that imagination is a skill, this fact has not played a significant role in philosophical treatments of imagination and the implications of it remain almost entirely unexplored.[2]

In an attempt to rectify this omission, this chapter undertakes a preliminary investigation into the categorization of imagination as a skill. In Section 27.1, I develop a rough framework for characterizing skills. In Section 27.2, I apply that framework to imagination. In Section 27.3, I consider three objections to considering imagination to be a skill and show how each can be answered. Finally, I close the chapter with some concluding remarks that focus on the philosophical payoffs that come from the recognition that imagination is a skill.

27.1   What is a skill?

The philosophical inattention to treating imagination as a skill is perhaps at least partly explained by a more general philosophical inattention to the notion of skill. As Jason Stanley and Timothy Williamson have noted, "analytic philosophers have shown little or no interest in the analysis of skill" (Stanley and Williamson 2017: 714). Carlotta Pavese makes a similar assessment, noting that the topic "has been marginalized" in analytic epistemology (Pavese 2016: 642). While there are a couple of contexts in which the notion of skill has played a key role – more specifically, it features in discussions of virtue epistemology and in discussions of the intellectualism/anti-intellectualism debate – there isn't a general philosophical consensus on what exactly skill is.

In what follows, however, I'll extract a rough analysis of skill from some recent work by Stanley in a paper coauthored with John Krakauer. While discussing the pre-theoretic notion of skill, Stanley and Krakauer (2013) mention three different components that are central to this notion.[3]

First, when someone is skilled at an activity, they are "better than baseline" at that activity; they have crossed certain performance thresholds with respect to the activity. What exactly will be involved in the relevant performance threshold will vary with the activity. Some performance thresholds relate to speed: the skilled crossword puzzle solver completes the puzzle more quickly than an average puzzle solver, and the skilled sprinter covers the distance more quickly than the average sprinter. Others relate to the complexity of the activity: the skilled juggler juggles more balls, and throws them in more elaborate patterns, than the unskilled juggler. Yet others relate to aesthetic characteristics: the skilled ballroom dancer moves across the dancefloor with more grace and elegance than the unskilled ballroom dancer. And so on.

Second, when someone is skilled at an activity, the activity is under their intentional control.[4] An unskilled crossword puzzle solver may sometimes solve a difficult puzzle, and

an unskilled juggler might occasionally manage to keep the balls in the air for several tosses, but if their successes arise from guesswork or luck, their performances don't count as skilled. Along these lines, consider Gilbert Ryle's discussion of the skilled clown: the clown "trips and tumbles just as clumsy people do, except that he trips and tumbles on purpose and after much rehearsal and at the golden moment and where the children can see him and so as not to hurt himself" (Ryle 1949: 33). Unlike the clumsy person's stumbles, the clown's stumbles are deliberate and controlled.

Third, the skilled person maintains and/or increases their skill by way of practice. This practice may involve explicit instruction via a trainer, or it may involve observation. Either way, however, repetitive efforts will be involved.

Having laid out these central features that characterize when someone can be said to be skilled at a certain activity, we are led directly to a corresponding list of the central features of activities that can be generally classifiable as skills. When an activity is a skill, it:

1. can be done more or less well;
2. is under one's intentional control;
3. can be improved via practice/training.

When we think about the many different sorts of varied activities that are usually classified as skills – from juggling and ballroom dancing to playing chess, solving crossword puzzles, and performing mental calculations – this list seems to be suitably inclusive.[5] Moreover, it does a nice job of excluding activities that are usually not classified as skills; activities such as blinking or raising one's arm or shutting a window. But does it capture all and only activities commonly thought of as skills? Probably not. Consider pattern recognition, an activity often referred to as a perceptual skill. Pattern recognition is a subpersonal activity of the perceptual system, done without any intentional guidance by the agent. Thus, on the analysis of skill we are extracting from Stanley and Krakauer, it does not seem that pattern recognition can count as a skill, since it is not under the intentional control of the person performing the action. For this reason, we should probably not think of the list as providing a set of necessary and sufficient conditions for skill, but rather as a list of central features of skill.[6] For our purposes here, this will be enough. Given that the list provides us with a robust sense of how skills can be classified, capturing paradigm cases of skills and not capturing paradigm cases of non-skills, we have an adequate framework to apply to the case of imagination. Doing so will be the main concern of the rest of this chapter.

27.2   Treating imagination as a skill

In order to see whether and how the framework developed in the previous section can be applied to the case of imagination, we need first to briefly explore what imagination is and how it has been typically characterized by philosophers. In doing so, it will be helpful to have an example before us. Here I'll utilize a case that I've used before, a case of two young boys playing a game of make-believe:

"Let's imagine that a scary monster is chasing us," Max says.

"What does it look like?" Sammy asks.

Max scrunches up his face, picturing the monster, before answering: "It's 20 feet tall, green with orange spots; it has huge claws, spikes on its tail, and big crooked teeth."

Sammy shudders as he imagines seeing such a monster. "I'd be really scared if I ever ran into that monster in real life," he tells his brother. "Let's hide behind that mountain," he adds, pointing to the living room sofa.

Later that night, while lying in bed, Sammy finds himself worrying that the monster has snuck into the closet and is waiting to attack the boys as they sleep. No matter what he tries, he can't stop himself from imagining it.[7]

Games of make-believe are just one context of many in which imagining plays a key role. Imagining also seems to be involved when we daydream, when we engage with thought experiments or with fiction, when we attempt to understand the thoughts and feelings of others (a process usually referred to as *mindreading*), and when we're involved in creative endeavors. It is also often involved in cases of problem-solving, decision-making, and planning. But attending to this specific example allows us to tease apart several different activities that go under the heading of imagining:

- *Propositional imagining*. When the boys imagine that a scary monster is chasing them, they engage in what philosophers typically call *propositional or attitudinal imagining*. Here imagining is likened to other propositional attitudes such as belief and desire.

- *Sensory imagining*. When the boys imagine the scary monster itself, and it's almost like they are seeing the monster before them, they are engaged in what is usually called *sensory* or *imagistic imagining*. When philosophers talk of imagistic imagining, they typically want the notion of imagery to be understood in a broad sense so that it means something like "sensory

presentation." In this sense, we can have auditory imagery just as we can have visual imagery, and likewise for all of the other senses.

- *Experiential imagining*. When the boys imagine feeling scared, they are engaged in what philosophers tend to call *experiential imagining*. Experiential imagining is very similar to sensory imagining and in fact, if we were to take the notion of "imagistic" or "sensory presentation" even more broadly than was just suggested, we might be able to capture emotional presentations under this heading and thereby capture experiential imagining under the heading of sensory imagining. Perhaps better, however, we can collapse imagistic and experiential imagining into a broader category that we might call *phenomenological imagining*.

Having distinguished these different types of imagining, the question now arises: When we think of imagination as a skill, which type of imagining do we have in mind? Just one type or all three? Though I think a case can be made that all three types of imagining can be brought under the framework of skill that we developed in the previous section, I also think the case seems to be clearest with respect to sensory and experiential imagining.

Generally speaking, propositional attitudes such as belief and desire do not seem to be the sort of things that are appropriately characterized as skills. Believing and desiring are not the kinds of things that are done more or less well. Though some people may be better at forming *true* beliefs than others, and some people may be better at forming *satisfiable* desires than others, this doesn't really make them better at believing or desiring in and of themselves. Believing and desiring also don't seem to be the sorts of things that you learn how to do via experiential techniques such as learning and observation, nor are they the sorts of things that you can get better at with practice. Part of the problem here is that believing and desiring (and, more generally, the having of propositional attitudes) are not really activities at all; they are not things we do. But if they are not things we do, then they cannot be things we do skillfully.[8]

Insofar as propositional imagination is like these other propositional attitudes, it seems that it too would not be properly characterized as a skill. Of course, there may be reasons to think that propositional imagining is relevantly different from these other propositional attitudes. For example, though belief may be best thought of as the *having* of an attitude toward a proposition, imagining may be best thought of as the *taking* of an attitude toward a proposition. That makes propositional imagining sound considerably more like an

activity than believing. Even so, however, it is not clear that propositional imagining can be done more or less well or that it is improvable via practice and training.

When it comes to sensory and experiential imagination, these problems do not arise. When Max and Sammy are playing make-believe, one of them might be better at imagining the monster than the other is, and likewise, one of them might be better at imagining the fear that they'd feel if the monster were really chasing them. These kinds of imagination also seem like the kinds of activities that one could improve by way of practice. The more the boys play make-believe, the better they might become at imagining the various elements of their games.

What about the fact that skills are generally characterized as being under one's intentional control? Here a worry might arise since there are many examples of sensory and experiential imagination that belie this claim. As I presented the case of Max and Sammy, when Sammy is in bed at night after having played monsters with his brother all afternoon, he finds himself unable to stop imagining the scary monster from the game. We can find many similar examples in the literature on imagination, e.g.:

> Often after seeing a particularly gruesome murder scene in a horror movie, I keep imagining the murder again and again. In such a case, I usually want the imagining to stop, I might even will myself to stop it, but I typically find myself quite powerless to stop the imagining. Analogously, after awakening to a catchy tune on the radio, the tune often runs through my head for quite a while; I might even be unable to keep from imagining it, in this way, all day long.

> *Kind 2001: 91*

These sorts of examples seem to set imagining apart from other skilled activities. We don't find ourselves powerless to stop ballroom dancing or juggling. But, in fact, this conclusion is a bit too quick. For consider another activity that's typically classified as a skill: remembering. We see a similar kind of "powerless to stop" phenomenon with respect to memory as we do with imagining. We might just find ourselves remembering an event from our past, or find ourselves powerless to stop remembering an embarrassing moment.

In fact, once we think more carefully about the notion of intentional control relevant to skill, we see that we need to refine our understanding of exactly what this condition involves. Consider a skilled activity such as skiing. Even someone who is a very skilled skier might find herself at times having lost control of what she's doing. But even if there are times while skiing that the activity is not under the skier's intentional control, skiing is still the kind

of activity that *can* be under one's intentional control. And likewise for imagining. Though there might be times while imagining that the activity is not under the imaginer's intentional control – as when Sammy can't stop himself from imagining the scary monster, or when I find myself powerless to banish a gruesome movie scene from my mind – imagining is still the kind of activity that *can* be under one's intentional control.

At least on an initial assessment, then, imagination – or more specifically, sensory and experiential imagination – seems to fit the framework developed in Section 27.1.[9] As we will see, however, further exploration suggests that there are several important objections that might be raised to this assessment. In the next section of this chapter, I will consider three such objections. Though I think the objections deserve to be taken seriously, the defender of the claim that imagination is a skill has plausible lines of response to each one.

27.3   Objections

The first of the three objections we will consider arises from thinking about two very different uses to which imagination might be put. When we imagine in contexts of daydreaming or make-believe, we are using imagination to move beyond the world in which we live. But when we imagine in contexts of thought experimentation, decision-making, and mindreading, we are typically trying to learn something about the world in which we live. In previous work, I have referred to these two uses of imagination, respectively, as the *transcendent* and *instructive* uses of imagination (Kind and Kung 2016). That imagination has two such different uses suggests that there would be two very different kinds of skills associated with imagination, a skill of transcendence and a skill of instruction. Someone who is very skilled at imagination in the first sense is good at unshackling her imagination and letting it roam free of reality, disconnecting from it. Someone who is very skilled at imagination in the second sense is good at tethering her imagination to reality in just the right way that she can learn from it. That there might be two such different skills associated with imagination shouldn't itself worry us. After all, when we consider marathon running vs. sprinting, we can see that there are two very different kinds of skills associated with running. But noticing these two different kinds of uses to which imagination is put might lead us to a deeper worry about whether both such uses of imagination really correspond to skilled activities.

Consider an objector who reasons as follows:

Transcendent imagination, insofar as it corresponds to creativity, might be a

skill. Since we see lots of people who are more creative than other people, it

makes sense to think that some people are better transcendent imaginers than others. But how could instructive imagination be a skill? If it were, then we should see some obvious examples of skilled imaginers. But we don't, so it's not.

Let's call this *the Socratic objection* since it seems to have faintly Socratic overtones: Just as Socrates brought Meno to see that we should expect to be able to find expert teachers of virtue if virtue is really the kind of thing that can be taught, our objector here is arguing that we should expect to find expert imaginers if imagination is really the kind of thing at which one can be an expert.

To respond to this objection, it's helpful first to recall that when someone is putting imagination to an instructive use, they are using their imagination to try to figure out how the world works, or at least, how some aspect of the world works. Once we put things this way, I think it's pretty easy to see that we do find experts at this. Consider interior decorators who are especially good at using imagination to figure out which curtains will best match the sofa. Or consider workers for a moving company who are especially good at using imagination to figure out how to make a large load of furniture fit into a relatively small truck.

Here it might be worth pausing over a couple of examples in a little more detail.[10] First, consider inventor Nikola Tesla. Although he's probably best known for his work on alternating current electricity, he also experimented with wireless technology and remote controls, X-ray imaging, and mechanical oscillators, and over the course of his life he patented about 300 of his inventions worldwide. In autobiographical works, Tesla explicitly credits his imaginative capacities as being responsible for his success. As he describes his design process:

> Before I put a sketch on paper, the whole idea is worked out mentally. In my mind, I change the construction, make improvements, and even operate the device. Without ever having drawn a sketch, I can give the measurement of all parts to workmen, and when completed these parts will fit, just as certainly as though I had made accurate drawings.

Tesla 1921

If we take Tesla at his word, and we have no reason not to, he provides us a notable example of someone who learns via imaginative exercises how various devices can be best constructed.

My second example comes from a very different domain. Consider master origamist Satoshi Kamiya. In 2006, Kamiya produced "what is considered the pinnacle of the field, an

eight-inch tall Eastern dragon with eyes, teeth, a curly tongue, sinuous whiskers, a barbed tail, and a thousand overlapping scales" (Kahn 2006: 60). Just the folding process itself took over 40 hours. Unlike other origamists, however, Kamiya produces his creations without the help of any software or computer aid. When asked how he can achieve such elaborate design without digital assistance, a feat that seems almost incomprehensible to his competitors, Kamiya's answer indicates the importance of imagination: "I see it finished. And then … I unfold it. In my mind. One piece at a time" (Kahn 2006: 63). Though Kamiya's imaginative efforts are aimed at a very different kind of result from that of Tesla, here too we have an example of someone who learns via imaginative exercises how a certain result can best be obtained.

Though these examples should put the Socratic objection to rest, another objection is lurking in the vicinity. Given that the imaginative skills of Tesla and Kamiya seem so out of reach to those of us who are not expert imaginers, it's tempting to think that they must simply have been born great imaginers. If this were right, then we would have good reason to think that imagination isn't a skill. Lots of recent work suggest that imaginative capacity differs from person to person, for example, that there are significant interpersonal variations in one's capacity for mental imagery.[11] But if this capacity is simply inborn, that is, if imagination were not the kind of activity that can be improved or maintained by training, then it wouldn't fit very well within the framework that we developed in Section 27.1. Let's call this *the nativist objection*.

To respond to this objection, I want to suggest that it is simply wrong about imagining. Just as one can become a better ballroom dancer or juggler via training and practice, so too can one become a better imaginer via training and practice. But before I address the issue of imaginative training directly, I want to consider a related skill to which one might think the same kind of objection would apply: memory. Someone who thinks that some people are just born with better imaginations than others will likely also think that some people are just born with better memories than others. Sure, perhaps we do some small things to improve our memories a little bit here and there, says this objector, but is memory really the kind of thing that can be improved with training?

Here, however, the answer is most definitely "yes." There have been various empirical studies that are relevant, but I'll here just mention one. This study, conducted by a team of researchers led by Anders Ericsson (Ericsson et al. 1980), aimed to see what kinds of improvements in memory could be achieved via a regular routine of practice sessions. The subject of the study was S.F., an undergraduate with average memory abilities and average

intelligence. Over the course of 20 months, S.F. participated in hourlong practice sessions about three to five times a week. At the start of the study, S.F. could recall random sequences of digits from lists that were seven digits in length. At the end of the 20 months, S.F. was able to recall random sequences of digits from lists that were 79 digits in length. His ultimate performance compares favorably to known memory experts, e.g., the mnemonist S famously described by A.R. Luria (1968).

With respect to memory, then, performance can be massively improved by serious training.[12] What, then, about imagination? Is there reason to think that differences in imaginative capacity, unlike differences in memory capacity, must be simply innate and not the result of training?

I can't speak to this issue with respect to Kamiya. I simply haven't been able to find information one way or the other. But with respect to Tesla, we have testimony that suggests that his gifted imagination owes in large part to deliberate training. In his autobiographical essay "My Inventions," Tesla describes how he successfully developed his imaginative capacities as a child. The process started when, as part of an effort to rid himself of some "tormenting" images from experiences in his past (such as when he'd witnessed a funeral), he would concentrate on something else he had seen. While this would work temporarily, he soon realized that he needed to conjure up new and more interesting images to focus his mind. As he notes:

> I instinctively commenced to make excursions beyond the limits of the small world of which I had knowledge, and I saw new scenes. These were at first very blurred and indistinct, and would flit away when I tried to concentrate my attention upon them, but by and by I succeeded in fixing them; they gained in strength and distinctness and finally assumed the concreteness of real things. I soon discovered that my best comfort was attained if I simply went on in my vision farther and farther, getting new impressions all the time, and so I began to travel – of course, in my mind. Every night (and sometimes during the day), when alone, I would start on my journeys – see new places, cities and countries – live there, meet people and make friendships and acquaintances and, however unbelievable, it is a fact that they were just as dear to me as those in actual life and not a bit less intense in their manifestations.
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> *Tesla 1919*

Of special interest to us is the fact that he was able to improve his imaginative abilities via effort and repetition. What was at first "blurred and indistinct" would eventually become strong and concrete.

Granted, the fact that these imaginative efforts began because he was afflicted by tormenting images suggests that he might have had some inborn capacity for imagination. But other activities typically thought of as skills have genetic components, and this does not count against their classification as cases of skills. No one denies that Michael Phelps is a very skilled swimmer, for example, but his genetics play a key role in making him so accomplished. He was born with an arm span longer than his height (unlike most people who have arm spans equal to their height), with the ability to hyperextend his joints, with a muscular system that produces only a low quantity of lactic acid, and so on. Likewise, sprinters tend to have more fast twitch muscle fibers compared to marathon runners who have more slow-twitch muscle fibers. Even given these inborn advantages, however, swimmers and runners still need to train and practice to develop and maintain their skills.

The examples we have seen so far are probably enough to show that the nativist objection should be rejected, but there are two more classes of examples that it will be useful to have before us. Further evidence for the ability to train one's capacity for imagination can be found in the use of guided imagery in meditation practices and from the use of visualization techniques in sports. Alongside their physical training, many of the world's most highly skilled athletes have trained themselves to become highly skilled imaginers. At the 2016 Olympic games in Rio de Janeiro, the U.S. Olympic team brought along eight sports psychologists who specialize in visualization exercises. Such exercises involve the athletes visually imagining themselves achieving an intended outcome, a particular movement, or an entire routine. Some athletes go even further by imagining not only the actions that they want to perform but the overall context and scene in which they will be performing it, from the surrounding sights to surrounding sounds and smells. In an effort to become better at the actions they will need to perform, they work hard to become better at visualizing those actions.[13]

With the nativist objection overturned by this discussion of training, we are now brought to the third and final objection that I'll here consider – what I'll call the *no feedback objection*. In answering the nativist objection, we discussed various examples where people seem to have improved their imaginative capacities by way of training. But as the proponent of the no feedback objection will say, however that training proceeded, it seems to be a weird and nonstandard kind of training. Normally in training the trainee gets some kind of feedback

that enables them to see whether they are doing better or worse. For example, when S.F. was being trained to memorize digits, he received feedback when he made mistakes, and in the next trial following a mistake, the sequence he was given went down by a digit. With respect to imaginative training, it is not clear how any such feedback could be given. How, then, can we ever tell that someone's imaginative capacities are actually improving? How can we have any criterion of success?

While this objection has more force than the previous two, I think that it too can be answered. With a little thought, we can see that there are ways to develop relevant training exercises with respect to imagination that would allow for the trainee to receive direct feedback. One possibility comes from image rotation tests of the sort that were done by Shepard and colleagues. In these tests, subjects were shown pairs of figures and asked to determine whether the second figure in the pair was identical (except for its rotation) to the first figure in the pair. While the experiments were initially designed for another purpose, they could easily be retooled into a slightly different experimental paradigm to work as training exercises for imagination.[14] Working with pairs of figures and asked to mentally rotate them to determine whether they were the same or different, subjects could be given direct feedback on whether their answers were correct. Moreover, when they can consistently make such determinations with figures of a certain degree of complexity, they could then be exposed to ones of greater complexity.

There are lots of similar kinds of experimental paradigms we might set up. An imagination trainer might buy a picture book of monsters and describe one to the trainee verbally and ask them to imagine what it looks like. The trainer could then show the trainee the picture and they could assess how well they did. Together they could go through the whole book. In this case, the trainee would be self-assessing, i.e., they would be giving the relevant feedback to themself. The trainer wouldn't be able to tell if what the trainee imagined really corresponded to what they were looking at, but the trainee would still be getting feedback. Moreover, if the trainee were a good artist, they could draw what they imagined and together with the trainer they could then compare the drawing to the picture in the book. This way, there would be direct feedback from the trainer on how well they were doing.

To give another example, suppose we wanted to see whether imaginative mindreading skills were improvable with training. A research team could recruit some undergraduates and hire them to work on their imaginative skills for an hour a day, three to five days a week. During this training, various emotional people would be brought in front of the

undergraduates, who would be asked to look and listen and then to imagine what the people were feeling. When the undergraduates report their judgments, the trainers could provide immediate feedback as to whether and to what extent those judgments were accurate.[15]

I suspect that each of these three examples could be nitpicked – and I don't have any special expertise at experimental design – but the point here isn't really about whether these kinds of training exercises are particularly well-designed or especially effective. Rather, the point is that the possibility of imagination training *that provides feedback to the imaginer* is not an incoherent one. Just as we can provide feedback to ballroom dancers in training and rememberers in training, we can also provide feedback to imaginers in training.

27.4   Concluding remarks

As the discussion of this chapter has shown, imagination seems to fit the general model of skills-based activities developed in Section 27.1. It is under one's intentional control, can be done more or less well, and is improvable via practice/training. At this point, however, one final question arises. What are the philosophical benefits to thinking of imagination this way? What are the payoffs for philosophers in reminding ourselves that imagination is a skill?

I will here briefly mention three. First, as we started to see in Section 27.2 above, there are a lot of different senses of imagination in play in the current literature. It's my suspicion that thinking of imagination as a skill – or perhaps as a set of skills – has the potential to unify some of the discussion and also give us a principled way of carving up the terrain. Second, thinking of imagination as a skill helps us to make sense of some conflicting claims about imagination that we encounter in the philosophical literature. This literature is rife with disagreements about what can and cannot be imagined. While these disagreements are often taken as a sign that imagination is not to be trusted, as a reason to disparage imagination, reminding ourselves that imagination is a skill shows that such disagreements are not a bad sign but are exactly what should be expected. Given that imagination is a skill, people will vary in their imaginative capacities. Thus, when one person claims to be unable to imagine some state of affairs that another person claims to be able to imagine, rather than throwing up our arms in despair and viewing both claims with suspicion, we should instead explore whether one of the individuals might be a more gifted imaginer than the other. Third, and relatedly, thinking of imagination as a skill helps us to think more clearly about the limits of imagination. In particular, when we make claims about what can and cannot be imagined, and especially when we take those claims to have philosophical importance, we should be sure that the claims are based on what can and cannot be done by skilled imaginers. The fact

that an unskilled runner cannot run a 100-meter course in under 10 seconds does not mean that it can't be done. Likewise, the fact that an unskilled imaginer cannot imagine some proposed state of affairs does not mean that it can't be done.

These three payoffs are specific to philosophical inquiry. But it's worth also noting that reminding ourselves that imagination is a skill has a further non-philosophical payoff. Claims are often made about the importance of imagination. Einstein, for example, famously said that imagination is more important than knowledge.[16] Recognizing that imagination is a skill can spur us to take action in inculcating it, both in ourselves and in our children. I close with a quotation from science fiction writer Ursula Le Guin that seems particularly apt in this context:

> The imagination is an essential tool of the mind, a fundamental way of thinking, an indispensable means of becoming and remaining human. We have to learn to use it, and how to use it, like any other tool. Children have imagination to start with, as they have body, intellect, the capacity for language: things essential to their humanity, things they need to learn how to use, how to use well. Such teaching, training, and practice should begin in infancy and go on throughout life. Young human beings need exercises in imagination as they need exercise in all the basic skills of life, bodily and mental: for growth, for health, for competence, for joy. This need continues as long as the mind is alive.
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> *Le Guin* 2016: 4

Acknowledgments

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[1] Thanks to Alon Chasid for pointing me to this example.

[2] For a couple of passing references to imagination being a skill, see White (1990: 138) and Taylor (1981: 206).

[3] While there are some other features of skill that Stanley and Krakauer mention, these additional features relate specifically to motor skills.

[4] Stanley and Krakauer put this point in terms of "rational control," but in explicating what this means they say: "The manifestations of what we would colloquially describe as skills are *paradigm examples* of intentional action, and are hence under our rational control." It thus seems plausible that we can understand "rational control" as

"intentional control." Doing so also enables us to ascribe skills to non-human animals whom we might be hesitant to characterize in terms of rationality.

[5] For a nice discussion of the great variety of activities that are generally recognized as skills, see Fridland 2014: 79.

[6] Stanley and Krakauer seem clearly to take each feature on the list to be necessary to skill, though they don't seem to intend these features to be jointly sufficient.

[7] This case is lightly adapted from a case I used in Kind (2016a).

[8] Compare Noë's discussion of digestion (Noë 2005: 279).

[9] In what follows, I will usually just refer to "imagination" rather than "sensory and experiential imagination," but these are the types of imagination I will have in mind.

[10] A third example comes from someone whose imaginative processes I've discussed at length in other work: Temple Grandin. See Kind (2016b) and Kind (2018). For her own descriptions of her imaginative processes, see Grandin (1995).

[11] See Phillips (2014) for a useful overview of this literature.

[12] Similar results have been achieved for other mental skills such as mental math. Researchers at Carnegie Mellon working with two ordinary undergraduates turned them into "lightning calculators" able to mentally solve multiplication problems involving two-digit by four-digit problems and two-digit by five-digit problems, e.g., 47×2568 or 59×79486. After about 300 hours of practice over four years, both undergraduates massively improved their performance and one of them became about as fast and as accurate as one of the known "expert" calculators. See Staszewski (1988).

[13] For two discussions of these visualization techniques from the popular press, see Clarey (2014) and Maese (2016). For a scholarly overview, see Suinn (1994).

[14] As originally utilized, image rotation experiments were meant to test whether the subjects' representations of the figures were pictorial in nature (Shepard and Metlzer 1971). Underlying the experiment was the thought that if a subject's response time corresponded to the amount the second figure would have to be rotated in order to confirm its similarity to the first figure (such that response time was longer when the figures needed more mental rotation and took shorter when the figures needed less mental rotation), that would suggest that subjects were working with pictorially encoded representations. Subsequent researchers have done work with image rotation figures that is relevant to the kind of imaginative training that I mention in the text above; see, e.g., Kail and Park (1990).

[15] This example relates to the kind of empathy training often undergone by physicians discussed by Leslie Jamison (2014; see especially Ch. 1). It also relates to the kind of empathy exercises often used on college campuses in sexual assault ally training. For a discussion of empirical evidence that "supports the general hypothesis that individuals can be trained to harness their imaginative activities in order to increase their empathic abilities," see Frank (1978: 336).

[16] This remark came in a 1929 interview with a reporter for the *Saturday Evening Post*. See www.saturdayeveningpost.com/2010/03/imagination-important-knowledge/