14
CONSCIOUSNESS AND SKILL
Barbara Gail Montero

14.1 Introduction
The conscious mind is sometimes seen as getting in the way of doing things well. In the popular press, consciousness is frequently vilified, whereas, automatic, unconscious action is prized: “Thinking about an action,” we are told, “is the sign of a novice, or a key to transforming an expert back into an amateur” (Epstein 2013), whereas “playing unconsciously” leads to excellence (Brennan 2007). Similar, though more nuanced, views are expounded by researchers who argue that skills falter when attention is focused on the lower level components of a skill (Papineau 2013) or when attention is directed toward the body (Wulf 2013) or when one is performing a skill in a situation free from unusual interferences (Beilock and Gray 2012). But are there compelling reasons to believe that the conscious mind is necessarily or even generally a nuisance in such situations?

Let me call the view that conscious attention to performance impedes skill in situations free from unusual interferences, “the just-do-it principle.” According to this principle, barring injuries or uncommon environmental hinderances, experts—by which I mean professional level athletes, dancers, musicians and others who have not only reached professional status, but are keen on improving—perform best when their conscious minds are disengaged from their actions, when, as I shall also put it, they are performing “automatically.” Although the idea that automatic actions proceed without conscious attention has been questioned (Fridland 2015), I follow my interlocutors and use the phrases “automatic action” and “proceduralized action” to refer to actions that lie outside the realm of conscious control, attention, working memory and, (for the most part) introspection. Furthermore, I take a rather broad view of what counts as conscious thought. For as I understand it, although consciously thinking in action is often verbalizable, I also maintain that one can consciously reason spatially and proprioceptively about one’s actions (which, as I use the term, includes reasoning about one’s movements, the effects of one’s movements and the environment in which one’s movements occur) without being able to
verbalize or at least readily verbalize this reasoning. For example, though sometimes one might be able to describe the arc of a tennis ball in flight and how one plans to respond to it, I suggest that it may be possible to be consciously reasoning about the ball in flight without being able to (readily) describe what you are conscious of.

So much for terminological niceties. My aim in this chapter is to lay out and, to the best of my ability, knock down what I see as the three central reasons wielded in support of just-do it: experimental data indicates that conscious attention to skill precipitates choking under pressure, certain actions proceed too quickly for conscious thought, and experts are frequently unable to recall what they do in their domain of skill. I conclude by offering some reasons to accept that online conscious thought about what you are doing is compatible with expertise, or, to put it in Igor Stravinsky’s stronger manner, expert skill demands the full consciousness of the expert. This is what I refer to as “the beauty of consciousness.”

14.2 Choking under pressure

Choking under pressure occurs when an individual performs significantly worse than would be expected in a high-pressure situation, such as when a tennis player on the verge of an important victory begins to double-fault every serve (Hill et al. 2009). Choking under pressure is relevant to the role of consciousness in expert skill because choking episodes are thought to arise because the anxiety such situations can produce lead one to focus on skills that should proceed without conscious attention (Baumeister 1984; Masters 1992; Beilock and Carr 2001; Ford et al. 2005; Jackson et al. 2006; Gucciardi and Dimmock 2008). Although proponents of this account of choking under pressure—the “explicit monitoring hypothesis” (EMH)—don’t deny that experts may consciously monitor their movements when something has gone drastically wrong, they maintain that in normal circumstances conscious monitoring interferes with high-level performance.

If EMH is correct, conscious attention is pretty much the bugbear it is made out to be. But is it correct? Support for the hypothesis is largely based on “varied-focus experiments,” in which two groups of participants—individuals experienced at a task and novices—are asked to perform a task under various conditions: as they normally perform it (the single-task, or control condition), while directing their attention to a specific aspect of their own movement (the skill-related supplemental task condition), and while engaging in an extraneous task (the skill-unrelated supplemental task condition). What has been found is that, relative to the control condition, the more highly skilled participants perform significantly worse in the skill-related condition yet only marginally (or negligibly) worse in the skill-unrelated condition, whereas novices, relative to the control condition, perform significantly worse in the skill-unrelated condition and, if anything, slightly better in the skill-related condition. In other words, the more highly skilled participants perform worse when consciously attending to what they are doing than when they are consciously attending to an extraneous task. For the less skilled participants, however, conscious attention does not interfere with performance while focusing on an extraneous task does. Such studies are seen as substantiating the precept, as Beilock et al. (2002) put it, that “skill-focused attention benefits less practiced and less proficient performances yet hinders performance at higher levels of skill execution” (14).

Although EMH garners substantial support in the psychology literature on choking under pressure, the strength of this support has been questioned. For example, Christensen et al. (2015) have argued that the type of foci usually elicited in the experiments are highly artificial, and thus the conclusions drawn from them may not generalize to real-life situations. Furthermore, it has been pointed out that many experiments testing EMH fail to produce the high-stakes situations
Consciousness and skill

athletes find themselves in when they are playing a real game, which leaves open the possibility that even if attention to a secondary task does not degrade performance in an experimental setting, it might degrade performance in the wild since performance in the control condition is already degraded due to lack of full attention and motivation (Montero 2016).

That said, it is perhaps too easy to question the ecological validity of such experiments. Experimental conditions are always going to differ from real-life conditions and it is an open question what counts as too much of a difference (Schmuckler 2001). Moreover, it is not clear how much the artificiality of the tasks impinges on the results since both the less and more experienced participants perform the same tasks, yet ability is differentially affected. Why is this, if not for the reason, as Beilock et al. (2002) conclude, that “well learned performance may actually be compromised by attending to skill execution” (9)? If one wants to counter just-do-it, something needs to be said about why skill-focused tasks skew the more experienced participants’ performance but not the less experienced participants’ performance.

And something can be said. To start, when success at a task is measured in terms of speed, a skill-related supplementary task may create comparatively more drag on the higher-skilled participants’ performance. For example, in one experiment, participants are asked to dribble a soccer ball through a slalom course. During the skill-related condition, participants are asked to identify, at the sound of a tone, which side of their foot was most recently in contact with the ball and, because under normal conditions the more experienced soccer players are faster than the less experienced players, thinking back to the most recent contact with the ball may be more distracting for them (because they have moved further ahead in the course) than for the less skilled players, thus slowing them down relatively more than the less skilled players. In another experiment, participants, while swinging at a virtual baseball, are requested to report at the sound of a tone whether their bats are moving up or down at that moment (Castaneda and Gray 2007) and it could be that the quicker you can perform such a task, the more detrimental it is to report on your movement, for reporting might slow you down to, or pull you toward, the tempo of the report, which is a greater reduction of speed for those who are quicker at performing a task than those who are slower at it.

Beyond this, because experts are better than novices at attending to their own movements, it could be that when asked to do so, they can do so with a vengeance; thus, the request to monitor an aspect of their movement that they normally would not monitor (or would not monitor exclusively) will be more distracting for experts than for novices. If recalling which side of the foot was most recently in contact with the ball is not relevant to their skill, this focus may interfere with their performance more than with novices’ performance, as novices are not able to monitor the details of their movements as well. For novices, the skill-related supplementary task generally resulted in a slight improvement over how they perform without any additional task. And this makes sense if one thinks that focusing on a skill can be beneficial, for it could be that since novices have not developed the ability to focus on any aspects of their movements intently, the skill-related supplementary task, which encourages such focus—even if the target of such focus is not ideal—results in a better trial than one without any bodily focus.

Finally, if we assume that some type of bodily focus is beneficial at high levels of performance and that distractions closer to or more similar to your intended focus impede performance more than distractions dissimilar to your intended focus, the skill-related supplementary task may have degraded the skilled participants’ performance more than the skill-unrelated supplementary task since it induced a type of focus that was close to, but not the same as that which the more highly skilled players have found beneficial. In other words, because the skill-related supplementary
task brings about a type of focus that is close to but not exactly the type of focus most beneficial for experts, it distracts experts more than the skill-unrelated task which, arguably, still allowed for some optimal conscious attention. Again, for novices, who may not have developed this important aspect of skill, there is nothing to be distracted from, and any improvements could be explained in terms of the task prompting a beneficial type of attention (cf. Bermudez 2017).

Thus, there are interpretations of the varied-focus experiments that are consistent with the view that consciousness is beneficial to skill. Should we nonetheless simply accept EMH as the best explanation for choking under pressure? It’s not clear that we should. Though most varied-attention experiments support EMH, not all do. For example, Suss and Ward (2010) asked expert shooters to monitor the action of their trigger finger while shooting and found that relative to a situation where the shooters were asked to focus on a skill-unrelated task, the shooters performed just as well (Sutton et al. (2011) present a theory that aims to account for such data). Furthermore, there is a competing account of the relationship between anxiety and choking, which, far from supporting the just-do-it principle, runs counter to it. On this view, referred to as the “distraction hypothesis,” high pressure draws attention away from the task at hand and to irrelevant aspects of performance, such as worries over how performance will be judged or the possibility of failure (Wine 1971; Gucciardi et al. 2010; Hill et al. 2010; Oudejans et al. 2011; Mesagno et al. 2011). Both the distraction hypothesis (DH) and EMH attribute choking under pressure to misplaced attention. Yet, to put the contrast in the starkest terms, EMH implies that the misplaced attention is directed toward the action while DH implies that the misplaced attention is directed away from the action.

The DH of choking under pressure turns on the idea that the enactment of expert skill draws heavily on working memory and is cognitively demanding. Extraneous thoughts, according to DH, coopt attention and thus interfere with one’s ability to store task-related information in working memory. Accordingly, studies supporting DH often investigate tasks that are thought to place high demands on working memory, such as solving math problems (Ashcraft and Kirk 2001; Beilock et al. 2004). However, the support for DH is not exclusively based on such skills, as it also reaps support from a number of studies, typically based, at least in part, on verbal reports of thoughts during competitions. These studies tend to indicate that task-irrelevant worries flood athletes’ minds during choking episodes (see, for example, Hatzigeorgiadis and Biddle 2000, 2001; Hatzigeorgiadis 2002; Lane et al. 2005; Gucciardi et al. 2010; Oudejans et al. 2011. Both Gucciardi et al. (2010) and Oudejans et al. (2011) seem to indicate that not only are task-irrelevant worries present during choking episodes but that they are far more common than task-related thoughts).

That said, just as there is room to doubt the results of the experiments that support EMH, there is also room to question the experiments that support DH. While the explicit monitoring theory, as we saw, is bolstered mainly by the results of controlled experiments, DH is bolstered mainly (though not exclusively) by studies that draw data from surveys, concept maps, or diaries, and such methods may also be subject to confounds. For example, there is usually a high drop-out rate in diary studies and memory is not perfectly reliable, perhaps especially in cases of extreme anxiety (Beilock et al. 2003). Ideally a robust theory of choking would emerge from a convergence of the two approaches. As things stand, however, it seems that the experimental data leaves open the question of whether conscious attention to skill precipitates choking under pressure.

### 14.3 Lightning-fast actions

In addition to leaning on the empirical data on choking under pressure, proponents of the just-do-it principle sometimes point out that certain skills proceed so quickly that they preclude...
Consciousness and skill

I take it for granted that some components of expert actions occur without conscious attention. For example, focusing on any one of the “three H’s” of the backstroke (hips, hands, head), might preclude focusing on either of the other two, which, if you are a proficient swimmer, will nonetheless do their part in propelling you through the water. However, I question whether experts initiate actions in response to cues that are processed entirely nonconsciously. Although I make no claim to prove that experts never process movement cues entirely nonconsciously, I argue that we lack compelling evidence for the view that some expert skills must be initiated so quickly that one can only react without consciously attending to what one is reacting to. More specifically, I question whether two examples often used to illustrate the impossibility of consciously processing movement cues—that of returning a tennis serve and that of making a move in speed chess—actually do illustrate this impossibility and argue that after the onset of a cue to act (such as a serve in tennis or a move in chess) there may be time to process the cue consciously.

Some philosophers, however, think otherwise. In sports such as tennis, David Papineau (2013) tells us, “there is not time to think once the ball has been released. You can only react” (177). And according to Jeffrey Gray (2004), a served ball is travelling so fast and the distance it needs to travel is so short that players must strike it back before they consciously see the ball leave the server’s racket. When Roger Federer serves to Rafael Nadal, Papineau (2017) explains, “he hits the ball at around 135 miles per hour from about 78 feet away,” which means, he continues, that there is “less than half of a second for the ball to reach Nadal. (Around 400 milliseconds, to be specific)” (21). Because it takes, Papineau tells us, 500 milliseconds for the receiver to become conscious of the ball and then another 175 milliseconds to execute the shot, “these numbers don’t add up” (23). Thus, according to both Gray and Papineau, rather than consciously registering how the ball is leaving the server’s racket and subsequently deciding, tennis players use anticipatory cues based on the server’s bodily movements prior to hitting the ball, which, they both hold, are also not processed consciously: thus, as Papineau puts it, “hitting balls in fast-reaction sports happens below the level of conscious awareness” (26). Nadal, as charming as he may be during interviews, is a zombie when it comes to returning serves.

That players rely on anticipatory cues is undeniable (see, for example, Williams et al. 2002). Whether such cues are processed entirely unconsciously is another matter (see Montero (2016) for some reasons to think that they may not be). However, let us put that issue aside and address the question of whether the receiver has time to consciously process the movement of the ball after it leaves the server’s racket. Do the numbers really not tally? Is it really true that “athletes [do not] consciously decide what to do once they see how the ball is coming at them [since] there’s no time for that” (Papineau 2017: 33)?

The numbers Papineau uses don’t tally since dividing distance (78 feet) by rate (135 mph or 712,800 feet per hour) gives us 394 milliseconds. Yet a smaller divisor seems called for. Courtside digital displays of serve speed, from which Papineau presumably gleans the 135-mph figure, are measured immediately after the ball ricochets off the racket. Yet tennis is not played in a vacuum: air resistance coupled with the friction of the court surface slow the ball down so that, on average, by the time the ball hits the opponent’s racket, its speed is roughly half of what it started out as (Yandell 2005). Tennis balls are fuzzy not to be cute, but to create drag. How do we figure out how long a receiver has then? Since spin of the ball, court speed (clay surfaces slow the ball down more than other surfaces) and, especially, the precise distance the ball travels should all be taken into account, there is no one simple equation. However, as with so many things these days, rather than painstakingly reasoning it out, it is easier to watch the video, and high-speed video analyses suggest that the amount of time receivers have to
return 120-mph serves (on a medium hard court with the returner three feet or so behind the baseline) is around 660 milliseconds (Yandell 2005).

Sometimes, of course, there is even less time; for example, data from Hawk-eye, a computer system widely used in numerous sports to track and predict ball trajectories, reveals that in the Wimbledon 2016 match between Andy Murray and Milos Raonic, Murray returned Raonic’s (initially) 147-mph serve in an unbelievable 577 milliseconds (Pickup 2017). So, the divisor Papineau plugs into his equation is too large. Nonetheless, if we accept that the rest of his equation is correct, zombie actions are still required.

But is the rest of the equation correct? That it takes around 175 milliseconds after players have determined which shot to make to execute it is, I gather, accurate enough. However, that it takes 500 milliseconds to become conscious of an input is, as far as I can tell, not. Although Papineau tells us that this number “is generally agreed [upon] by vision scientists,” there is, from what I gather, quite a bit of controversy over how to set up experiments investigating when consciousness kicks in during perceptual tasks (see Wiens 2007; Sandberg et al. 2010; Peters et al. 2017). Some researchers find their way through this controversy: David Eagleman and Terrence Sejnowski (2000) suggest an 80-millisecond time lag, with Eagleman emphasizing in an interview that this is only an average, commenting that for all he knows “perhaps fighter pilots live less in the past than the rest of us” (Salk Institute 2000). And although more recent work points to a longer lag—proponents of the so-called “local recurrence theory” argue that consciousness of visual stimuli takes between 100 and 200 milliseconds after stimulus onset (Lamme and Roelfsema 2000; Lamme 2010) while proponents of the “global workspace theory” maintain that it takes between 300 and 400 milliseconds after stimulus onset (Dehaene and Changeux 2011; Del Cul et al. 2007)—none report 500 milliseconds.

That said, the window for thinking is not large. It may not be literally true that “we’re talking about eye-blink-fast” reactions (Papineau 2017: 32). The mean duration of a blink, from the point at which the eyelid begins to close to the point at which it is fully open again seems to be around 400 milliseconds, with only a fraction of a millisecond of that time being taken up by the period during which the eyelids are closed (Espinosa et al. 2018). Nonetheless, tennis players must react quickly, but, for all we know, perhaps not so quickly that conscious thought is precluded.

The amount of time one has to respond in lightning chess, which allows one minute per player per game, is also extremely short. But is there no time for conscious thought? The philosophers John McDowell and Herbert Dreyfus, as different as their views are in many respects, nonetheless agree the speed at which players must react in lightning chess precludes conscious thought, or at least that conscious thought—and in particular “explicit commentary (on the passing scene or on what one is doing)” (McDowell 2007)—would significantly hinder one’s skill at the game.

An experiment I conducted to probe the speed limits of conscious thought in lightning chess, however, fails to support the Dreyfus/McDowell view (Montero 2019). I had four accomplished chess players—two masters, one national master and one (retired) international master—think aloud, saying what came into their minds, if anything, as they were playing a game of lightning chess with a similarly ranked opponent on an online chess site. All were able to do this and the results were what would be expected given the pairings: when paired against slightly weaker players, they won; against slightly stronger ones, they lost, making for three wins and one loss. This suggests that thinking aloud while playing does not significantly hinder chess performance. However, given the small number of trials and given my coarse-grained means of evaluating their level of skill (which took into account only outcomes of the games and did not also employ an independent analysis of the quality of the moves) it was not possible
to determine whether the wins were due to the players playing as they normally would or whether the skill differential permitted them to win despite playing slightly worse than normal. Indeed, as Grandmaster Michael Rhode commented when I explained the experiment to him, they likely did perform slightly worse than normal since “doing anything extra is going to take attention away from the game … [the participants’ skill will be impacted since] saying your thoughts out loud is extra.” Vocalizing their thoughts may have hindered the games slightly, but there is no reason to believe that conscious attention, itself, did.

14.4 Post-performance amnesia

The final pillar of support for the just-do-it principle that I want to question is motivated by the fact that highly skilled individuals—professional ballet dancers, tennis players, musicians and others—sometimes perform optimally yet shortly afterwards report not remembering anything about what they did. For example, in an interview with Alex Zolbert (2012), tennis champion Maria Sharapova claims that she had no idea what happened when she beat Martina Navratilova; after Zolbert commented that without such knowledge, she is lucky that her groundstrokes didn’t go into the net, she countered, “maybe they were in the net.” Apparently, her memory was so impoverished, she couldn’t tell.

The standard explanation of such “post-performance amnesia” is that expert actions are performed without conscious attention, they are, as Beilock and Carr (2001) put it, “controlled in real time by procedural knowledge” (702). Procedural knowledge couples well-worn neural programs—programs that run without the intervention of conscious control, programs that run autonomously—with action. And since an automated action, as it is generally understood, “requires little attention, operates largely outside of working memory, and is substantially closed to introspection” (Beilock and Carr 2001: 702), and since long-term conscious memory formation requires attention (Schacter 1996; Fernandes et al. 2005), it follows that high-level skills ought to leave impoverished consciously accessible memory traces.

Does post-performance amnesia occur? It seems to. It has anecdotal support and Simon Hoffding’s (2015) qualitative study of the performing experiences of members of the Danish String Quartet indicates that, though rare, the quartet members had periods of time performing or rehearsing that failed to leave long-term memory (i.e. longer than 30 secs) traces. In any event, I accept that post-performance amnesia sometimes occurs. What I question, however, is the idea that the best way to explain such memory blanks is always in terms of the conscious mind going on holiday. Sometimes the conscious mind does go on holiday, but if conscious attention to action is an important component of expert skill, then such vacation-performances should be sub-optimal.

Although I can only speculate, I think that there are two other possible explanations for post-performance amnesia that do not turn on the idea that such performances are automatic. One possibility is that post-performance amnesia may occur when performers are focusing so intently on their actions that each moment of attention interferes with long-term memory formation of what was previously attended to. It is known that a distraction task immediately following a memory task that failed to leave long-term memory (i.e. longer than 30 secs) traces. In any event, I accept that post-performance amnesia sometimes occurs. What I question, however, is the idea that the best way to explain such memory blanks is always in terms of the conscious mind going on holiday. Sometimes the conscious mind does go on holiday, but if conscious attention to action is an important component of expert skill, then such vacation-performances should be sub-optimal.

Although I can only speculate, I think that there are two other possible explanations for post-performance amnesia that do not turn on the idea that such performances are automatic. One possibility is that post-performance amnesia may occur when performers are focusing so intently on their actions that each moment of attention interferes with long-term memory formation of what was previously attended to. It is known that a distraction task immediately following a memory task, interferes with long-term memory formation. An early illustration of this comes from Müllner and Pilzecker’s (1900) pioneering study in which participants, after they attempted to memorize a list of syllables, were presented with a new syllable list either 17 seconds or six minutes later. In the 17-second condition, participants recalled 28% of the syllables whereas in the six-minute condition this increased to 49%. This and numerous recent studies of both humans and non-human animals, using both behavioral and neuroimagining approaches, are thought to support the idea that distraction immediately following a memory
task can serve as a “retroactive interference” impeding long-term memory formation (see, for example, Dewar et al. 2009; for a review, see Wixted 2004).

On the automaticity account (Beilock et al. 2002), post-performance amnesia is explained in terms of expert actions being so fully automated that the conscious mind is not present during performance. My proposed alternative, “deep engagement,” is consistent with the view that expert actions are proceduralized to a large degree. A selective focus on one aspect of a skill is only possible if the other aspects of the skill proceed automatically. However, it does not require the type of full proceduralization of action that is required to explain post-performance amnesia on the automaticity account. Rather, the deep engagement account maintains that when challenges are present and surmounted with aplomb, yet rapidly forgotten, conscious attention is so keenly focused on the moment that each subsequent period of attention impedes memory formation of the previous period.

Another possibility is that post-performance amnesia may occur when performers are highly focused on aspects of their bodily skills that are not readily expressible in words. When you close your eyes and feel your right arm extend so that it forms a 90-degree angle with your torso, your sense of proprioception along with a declarative conceptualization of your position, helps you to judge the angle formed by your torso and arm; you might think, “my arm is at a 90-degree angle from my body.” And if you conceive of your arm position in this way, you will likely be left with a declarative memory of having assumed that position. If someone later asked you what position you were in a few minutes ago, barring intervening distractions (for example, barring situations where you continually moved into other angles) you would be able to report that you had assumed the position in question. But if conscious awareness of our movements and positions outstrips what we can presently put into words, it may be that an exclusive focus on nondeclarative elements or qualities of our movements and positions will result in our inability to say anything, or at best very little about what had just transpired.

If conscious attention to skill is beneficial, then such attention should enable one to do certain actions that otherwise one would not be able to do or not be able to do as well. In other words, such attention must be a form of practical reasoning outside of language. Yet it is difficult to see how this could occur. As Michael Devitt (2006) points out, “we still have very little idea of how thinking could proceed if thoughts were not language-like” (147).

Admittedly, the idea that one can reason outside of language is controversial (Buckner 2019). However, it has been argued that humans engage in nondeclarative spatial reasoning in navigating (Camp 2007), in playing chess (Montero 2016) and in some forms of mathematical thinking (Montero 2016). Might tennis players, when running to return a serve, engage in conscious nonverbal spatial reasoning? If they do, and if this were their sole conscious focus, they might be left without any declarative memory of what they had done.

I would also like to suggest that enacting a skill sometimes involves conscious, proprioceptive reasoning. What is proprioceptive reasoning? Proprioceptive reasoning, as I see it, is reasoning about the moving body. It can involve conscious reasoning about tempo, force, shape, quality of movement (smooth, sharp, etc.). It may be remembered when it can be expressed in words (tempo, force, etc.). However, the type of proprioceptive reasoning that would result in post-performance amnesia (if it exists—for, remember, this is speculative) would be reasoning about qualities of the moving body that cannot readily or perhaps at all be put into words (see also Montero 2019; Høffding and Montero 2019).

On the standard account, post-performance amnesia results when experts’ conscious minds are not engaged during performance. In contrast, according to the two alternative explanations I’ve just tendered, post-performance amnesia occurs when the nature of the performers’ conscious experience leaves them unable to recall what they have done (cf. Bermudez 2017).
14.5 The beauty of consciousness

Consciousness is sometimes seen as detrimental to expert performance because it is thought that experimental data indicates that conscious attention to skill precipitates choking under pressure, that certain actions proceed too quickly for conscious thought, and that experts are occasionally unable to recall what they do in their domain of skill. I have attempted to counter these three reasons to doubt the relevance of consciousness to expert-level skill. Although my criticisms fall short of providing a reason to think that conscious attention is beneficial or even compatible with expert performance, I think that it is both of these things: even when there is nothing out of the ordinary that would demand an expert’s attention, expert skills generally proceed best when the conscious mind is in control. This is “the beauty of consciousness.”

My most salient motivation for thinking that experts consciously attend to their skills comes from first-person experience. I was a professional ballet dancer, and I recall (it seems to me) consciously thinking during performances. Of course, memory is labile, but I have recently taken up dancing again (in part to be my own research subject) and during both performance and practice, it at least seems to me that I frequently focus on the aspects of my skill that I want to work on or play with and that this object of my focus can be anything from the rise and fall of an emotion to the rise and fall of my pinkie finger. And I am not alone among dancers in adopting this type of focus: When Guss-West and Wulf (2016) surveyed 53 international professional ballet dancers to identify what these performers focused on or imagined when preparing and executing a variety of actions, they found that 72% of responses related to body movements.

But is such attention beneficial? I think that there is an argument based on Anders Ericsson and colleagues’ research into what he refers to as “deliberate practice” (Ericsson et al. 1993) that suggests that it is at least compatible with optimal performance. Deliberate practice, as opposed to mere repetition, is practice with the specific aim of improvement, often involving focusing on aspects of a skill that are most challenging. According to Ericsson, those who excel engage in deliberate practice. And according to most everyone, improvement requires conscious thought. Now, performance is different from practice as one can’t stop and do something again and one might also be more risk-averse. Nonetheless, I think it is reasonable to maintain that if an athlete or performer engages in conscious thought during practice, then some level of conscious attention will be compatible with performance.

Beyond this, consciousness attending to one’s actions can be engaging. The cellist Ivan Luza told me that he never performs the Bach cello suites the same way twice because he is always trying to discover something new. And, when Luza is playing Bach, such fun often does lead to beauty, both in the standard use of that word and in my ideocratic sense of improvement of skill since, as he explained, playing is a form of experimental investigation into what works and what doesn’t.

Of course, when the aim is to win, one might not have the luxury to experiment. But, arguably, one does not always play exclusively to win; sometimes, even during a tournament, one aims at improvement. Finally, one also typically wants to do better than ever, not only next time, but also this time. And consciousness would play a role in achieving this aim since automaticity leads to stagnation (Ericsson et al. 1993).5

14.6 Concluding cerebrations on the philosophical import of conscious skill

What is the philosophical relevance of the research into the role of conscious attention during the execution of skill? I would like to suggest that it has a rare philosophical implication: it
illustrates how consciousness—a feature of the world that philosophers sometimes claim resists scientific explanation—can be, and is, studied scientifically. To be sure, the scientific investigation into the role of consciousness in skill may not fall under that heading of what philosophers such as David Chalmers (1996) refer to as “the hard problem,” which is the problem of explaining how a mere physical machine, such as the brain, can produce conscious experience. But the way to solve the hard problem might be both to accept that physical machines like our brains are not so mere as philosophers sometimes make them out to be, and also to let science tackle the available problems of consciousness until the hard problem fades away, if not entirely, then at least into that isolated corner of inquiry filled with philosophical conundrums that merely reveal something about our cognitive capacities. In other words, perhaps it’s time to move on.

Notes

1 In this passage, Papineau actually says that it takes 500 milliseconds for the ball “to come into clear focus.” Because his conclusion to this “no time” argument is that “athletes [do not] consciously decide what to do once they see how the ball is coming at them” (33), I’m interpreting “clear focus” to mean “conscious focus.” With such an interpretation, his argument is valid (but, as I later argue, not sound).

2 And such anticipatory cues might be conscious (Montero 2016).

3 There is some indication that a reaction to an auditory stimulus can be under 85 milliseconds (Pain and Hibbs 2007), and it is sometimes speculated that tennis players grunt to cover up the auditory cues. Yet disagreement exists over the proper method for measuring reaction time (Wickens and Hollands 2000).

4 The view I am advocating resonates with Shepherd (2015).

5 This is all assuming consciousness is not epiphenomenal, which I think is a reasonable assumption (Montero 2007 and in progress).

References


Barbara Gail Montero


Consciousness and skill

