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How to be skilful: opportunistic robustness and normative sensitivity

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Abstract In a recent article, Fridland (Synthese 191:2729–2750, 2014a) characterises a central capacity of skill users, an aspect she calls 'control'. Control, according to Fridland, is evidenced in the way in which skill users are able to marshal a variety of mental and bodily resources in order to keep skill deployment operating fluidly and appropriately. According to Fridland, two prevalent contemporary accounts of skill—Stanley & Krakauer's (Frontiers in Human Neuroscience 7:1–11, 2013) and Hubert Dreyfus's (Phenomenology and the Cognitive Sciences 1:367–383, 2002)—fail to account for the features of control, and do so necessarily. While I agree with Fridland that features of control represent desiderata for a satisfactory characterisation of the capacity of skills to respond to perturbations, I argue that her account is limited in two ways; first it is applicable only to a particular class of skills I call *motor skills*, leaving other classes of skills unaccounted for; second, she employs a problematic distinction that rules out the automatic and pre-reflective use of discursive, propositional cues in skill deployment. I put forward a critical elaboration of Fridland's account based on two more general characteristic features of skills I call *opportunistic robustness* and *normative sensitivity*. I suggest that these features avoid the difficulties isolated, while preserving the substance of Fridland's account of control.

Keywords Skill · Normativity · Rationality · Intellectualism · Phenomenology · Control

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1 Introduction

In their well-known model of skill acquisition, Stuart and Hubert Dreyfus sketch five distinct developmental stages, each of which characterised by "changes in the perception of the task environment" (1980; see also Dreyfus and Dreyfus 1986, and Dreyfus 1997). Transitioning through these stages, one gains increasingly context-sensitive, holistic, and hierarchical recognitional capacities for how one's skills can and should be applied. Eventually, through hard work and effort, one can become what they call an 'expert'. But there is an interesting question to be asked of Dreyfus and Dreyfus: what are we to make of experts who describe strenuous, ongoing practice routines? If experts already have the requisite recognitional capacities for masterful, skilled performances, why do they continue to hone their craft, and what exactly are they honing?

I don't think the solution here is to posit another, subsequent level—say, 'expert-plus'—but to suggest that there is a lacuna in Dreyfus and Dreyfus's (1980, 1986) account. Though there is some discussion of how repeated instancing of skills can increase the sensitivity of recognitional capacities, they have little to say about the maintenance of skill, nor what such maintenance might consist in[1]. It is not clear what Dreyfus and Dreyfus would say about the expert pianist, who continually plays and practices already well-rehearsed pieces, as such experts would already have the necessary capacities and sensitivities needed to perform the music printed on the page.

In a recent article, Fridland (2014a) argues that accounts of skill must include structures that explain the maintenance and development of skills, including expert skills. Her target in the article is to outline a number of characteristic features of skills and skill users that she together calls *control*. Control, as I understand it, points at a characteristic capacity of skill users to respond appropriately to perturbations and thereby keep skilled performance on track[2]. The characteristic features Fridland discusses, then, pick out structures and processes responsible for such a capacity, which keeps the deployment of skills at an optimal level (however optimal the situation allows). Such structures are complex, mediating between reason-responsive capacities and lower-level sensory and motor abilities. But not only do these structures mediate psychological abilities, they also play a role at several time scales: control is seen in the crafting of overall strategies for the satisfaction of intentions; in reining-in and directing sensory resources; and in employing motor responses hardy enough to deal with a wide variety of contextual factors. For Fridland, control is developed and maintained in attentive practice, where one expends effort in an attempt to improve various aspects

[1] Though, as I discuss below (in Sect. 4.2), Hubert Dreyfus has developed a characterisation of the structure of skills that does aim at addressing these issues.

[2] Such a capacity is what Fridland refers to as the ability to "focus on pressing situation demands such as adjusting [one's] goals and strategies in the appropriate ways while allowing motor routines to run on their own." (Fridland 2014a, p. 20).

of skill deployment[3]. It is in such attentive practice that the possessor of expert skills is able to continually refine and hone her capacity to respond to perturbation.

Despite its role in explaining skill development and maintenance, practice, as I see it, is not the focus of Fridland's account. To see why, consider the two ways in which one might highlight the role of practice in relation to skills. On the one hand, one can discuss the structure and constitution of skills in and of themselves, articulating what such structures consist in, and how they are related to one another. With a structure of skills on the table, one can then argue that practice plays the role of developing and maintaining such structures. On the other hand, one might focus on the fine-grained causal processes by which practice leads to increases in dimensions of behaviour associated with skills and skilled behaviour; perhaps by carrying out detailed neurobiological or psychophysical studies. I take it that Fridland is focused on the former: she is concerned with detailing the structures and features she thinks are constitutive of skills. Indeed, Fridland argues that structures characterised by control are constitutive of skills, insofar as they account for the capacity to respond to perturbation, and are necessary to explain the development and maintenance thereof (Fridland 2014a, pp. 2729–2732). In the process of sketching the key features of this capacity, Fridland suggests that two contemporary accounts of skill—Stanley and Krakaeur's (2013) and Dreyfus's (2002)—not only fail to notice the features associated with control, but in the end do not have the resources necessary to accommodate or explain them.

In this article, I will agree with Fridland that the development and maintenance of the capacity to respond to perturbation is a necessary explanandum for any account of skill. However, I will disagree that the structures of control she puts forward are the best way of capturing this capacity. I will argue that Fridland's characterisation of the capacity to respond to perturbation is limited in scope: it only applies to motor skills (such as those employed by the professional athlete), but cannot accommodate the wide range of skills that we associate with semantic phenomena (such as those demonstrated by the skilled poet, comedian, or scholar). However, I believe that Fridland's account contains more than a kernel of truth: In the last two sections, I suggest that we should replace Fridland's three characteristic features of control with two, more general features, I call *opportunistic robustness* and *normative sensitivity*. I thus offer a critical elaboration of Fridland's account: her three features of control turn out to be just the way in which opportunistic robustness and normative sensitivity are instantiated in the deployment of motor skills. I conclude by suggesting that these two characteristic features are general enough to encompass both motor and semantic skills.

[3] 'Attentive practice' might suggest a focused, conscious effort to observe, repair, maintain, and improve various capacities and processes. Though Fridland might be read as suggesting such an intellectualist approach to practice when she states that practice is "effortful, attentive, intentional" (Fridland 2014a, p. 2741), I believe a deflationary reading of these terms is more in tune with the arguments presented. Such a deflationary reading would hold that when one practices, one is deeply engaged in an activity with an intention (which need not be consciously entertained) to improve. It is in this way that I use the phrase 'attentive practice'. I thank an anonymous reviewer for pressing me on this point.

2 Practice and control

What is the difference between my performance, and that of the renowned concert pianist Angela Hewitt, when we each sit down to play the *Goldberg Variations*? Assume that we can both play through all the variations, hitting all the right notes at the right tempo—why then does her performance sound *so much better* than my own? I do not think the relevant contrast here concerns the piano each of us would be playing: I could play her Fazioli and she could play my sticky-keyed electronic piano, and I suspect her performance would still sound better. So if the choice of piano, and the ability to play the notes correctly are not relevant differences between Hewitt and myself, what might the relevant differences be? One such difference is the way in which Hewitt can perform subtle emphases in dynamics, together with her ability to highlight distinct yet complementary musical phrases. I would also point to her greater knowledge of musical history and theory, as something that gives her a greater appreciation of the structure and flow of the piece. We can summarise such differences, I suggest, by stating that Hewitt's piano playing skills have greater *depth*, *subtlety*, and *reliability* than mine, due to a richer stock of knowledge structures and motor capabilities.

Fridland suggests that what distinguishes my piano playing from masters like Hewitt (or Argerich, or Horowitz) is that they have (or have more of) abilities to put into play a suite of "exact, nuanced, micromillimeter, microsecond adjustments and modifications" (Fridland 2014a, p. 2737). These minuscule adjustments moreover, "are painstakingly learned and developed through countless hours of practice and training." (*Ibid*) What these lightning-quick and accurate modifications realise, Fridland suggests, is the ability to recover and respond to perturbations in the ongoing deployment of skills: they allow skilled performance to stay on track. This capacity is explained by what she calls *control*.

What does control consist in, if it explains the capacity of skill users to respond to perturbations? I suggest it should not be identified with the set (or conjunction of sets) of all such potential or actual adjustments that an individual could make at a particular time. This would mistake a capacity with its customary effects. Instead, control picks out a suite of processes and structures that together instantiate the ability to keep skill deployment ticking along. What characterises this motley crew, Fridland suggests, are three features she calls 'strategic control', 'selective, top-down, automatic attention' (what I will call 'attentional control'), and 'motor control.'

Strategic control consists in "goals, plans, and strategies that the agent uses in order to guide various instantiations of motor skill," and is often, "though not necessarily, conscious" (Fridland 2014a, p. 2744). What strategic control consists in, I suggest, is guiding *implementation strategies*: clever ways in which agents marshal a variety of skills and tactical decisions to satisfy their goals. Consider the savvy tennis player here: assume that she knows, for one reason or another, that her opponent has a weak or predictable backhand. She can employ this knowledge in any number of ways in order to beat her opponent: perhaps stringing together shots that push on the weak backhand; or by consistently producing powerful serves that exploit a predictable return. Both of these tactical decisions result from using knowledge in conjunction with skills to achieve goal-satisfaction.

Fridland rightly notes that it is not necessary for reasons or knowledge to be consciously entertained in order to play a role in strategic control. To return to our tennis player, she may have merely noticed (without entertaining the thought) that her opponent's backhand was faltering, and adjusted her strategy accordingly. Despite not being entertained consciously, these reasons are still likely to be *Anscombean*. They are the kind of reasons that, if we stopped the tennis player and queried as to why she was continually playing to her opponent's backhand, she would have no problem or hesitation in answering: she was playing to the backhand because it was faltering, because it was predictable, and so on[4].

The ability to recognise and employ reasons, and the ability to draw appropriate inferences and strategies accordingly, are both abilities that need to be learned, developed and maintained. But they are deeply integrated with lower-level processes that orient sensory systems towards potentially salient information in the environment: it's only when such systems are aligned with the environment in the right way that individuals can pick up on epistemically important information in the world. The structure responsible for such orientating is what I call 'attentional control' (Fridland's 'selective top-down automatic attention). It consists in "selecting the relevant features in an environmental array that a skilled agent should gather information about and respond to, given her goals, plans, and strategies." (Fridland 2014a, p. 2746).

Fridland's diagnosis here is that "learning a motor skill requires more than learning how to control one's body, it also requires learning how to control one's attention." (*Ibid*) Skill involves the ability not only to perform skilled behaviour, but also to pick up on where and when performance of particular behaviours are appropriate: Should the hockey player pass the puck to the defenseman (and maintain possession) or should she take the shot (and thus likely lose possession)? What the skilled hockey player relies upon in these decision-making situations are contextually relevant reasons. If our hockey player notices that the defenseman on the blue-line is not in a good position, she would know that taking a shot on net is likely to be the best option, even if she were not in an ideal position. But being able to extract such contextually relevant reasons requires a capacity for aligning one's self with the situation—for being 'ready' to pick-up on potentially salient information.

Our hockey player shows how one's reasoning capacities are only as good as the information coming in: she will not be performing optimally if she is not attuned to the right sources of information in her environment. As I hope to have made clear, then, Fridland's attentional control is the complement to strategic control: the trained, automatic routines of attentional control orient experts to potentially salient information in the environment by bringing these to the foci of their sensory systems. Once picked up by sensory systems, such information is poised for use by rational capacities. Thus, while attentional control "is automatic," it is "sensitive to the semantic content of the intentional states of the agent." (*Ibid*) That is, it serves the overall intentional satisfaction of goals.

[4] This should not be conflated with the claim that experts can always provide reasons for why or how it is they did the precise movements or actions that they did: experts regularly fail to accurately describe the minutiae of their own performance (Wallis 2007, p. 130).

The contrast I have just drawn, to be clear, is between the *automatic processes* of orientation-routines (attentional control) and the *non-automatic* reason-responsiveness of strategic control. While orientation routines can be trained to align with particular situations or features in the environment, the alignment with such 'environmental arrays' does not yet mark out a process of reason-responsiveness. Attentive orientation routines are selective attunements, and while they engender changing arrays of sensory information, these changing arrays are not reasons, though the content of such sensory experiences may be *rationalisable* (see: Crane 2013).

The third and final feature of control is what Fridland calls *motor control*. Motor control facilitates the deployment of skills: the smooth graceful movements of the ballerina, the percussive movements of the pianist, and the swinging hips of the golfer. Motor control is not evidenced in the skills themselves, but in those physical modifications that respond and fix or otherwise *tweak* the skill in its deployment. It consists, as I understand it, in sensitive bodily responses to a wide variety of situational parameters. As Fridland characterises it, "motor control is crucial for accounting for the exact, nuanced ways in which a skilled performer modifies, adjusts and guides her skill instantiation" (Fridland 2014a, p.2748). Motor control involves keeping skilled behaviour within the parameters of the task environment as best it can, in being ideally attuned (or suited) to the situation such that skill can be fluidly deployed.

Keeping skilled behaviour in check involves lightning-quick responses: the 'nuanced micromillimeter, microsecond adjustments' that so impress Fridland. The requisite speed of such adjustments implies that they are not suitable for intervention by conscious awareness—they are *automatic*. Indeed, Fridland calls them 'automatized motor routines,' bringing to mind the rote behaviour of repeat actions. But the notion of automaticity here need not mean mechanical, nor unintelligent[5]; in fact, it is precisely by being context-sensitive and appropriate that these adjustments do their work. Further, many of these motor routines may be performed slowly and attentively during practice, at a speed where conscious awareness and intervention is possible. But despite attentive intervention at practice-time, such interventions might not be possible when push comes to shove in real-time performances. I take it that when Fridland calls a process like the adjustments of motor control *automatic* she has this 'too fast to think' notion in mind.

Let me attempt a summary. Fridland's characterisation of the capacity underwriting the ability of skill users to respond to perturbation (control) has three characteristic features. First there is a general capacity to employ reasons in a wide variety of decision-making processes to satisfy goals. These capacities are reliant upon automatic orienting routines that align one's sensory systems with potentially salient and information-rich aspects of the environment. Finally, we have a suite of automatic motor responses that allow for the overall smooth functioning of skills when deployed. This smooth and automatic function is what frees one's attentional resources to selectively attend to environmental arrays, which in turn allows for more strategic thinking, and so on. Finally, attentive practice, as I understand from Fridland's account, consists in improving the overall reliability, subtlety, and speed of such processes for the overall aim of satisfying goals.

[5] See: Fridland (2014b).

3 Control, discursive cuing, and semantic skills

3.1 Two critiques of control

Fridland argues that the three features of control she isolates are "constitutive of skilled action" (Fridland 2014a, pp. 2729–2732). However, as Fridland's examples suggest, her account is only meant to apply to what I will call *motor skills:* gymnastics, yoga, golf, football, tennis, and the like. But how then, are we to account for other skilled actions? After all, we consider poets, scholars, comedians and the like to be skilled. And while these skills might involve a motor component it is not clear that Fridland's control adequately captures the capacity of such *semantic skills* to respond to perturbation, nor how such robustness develops in attentive practice. I show in Sect. 3.3 that not only does Fridland's account of control not say anything about this latter category of skills it also cannot, because her account seems to take motor skills to be an essential and constitutive component of skill. Yet, by targeting a capacity seemingly shared by all skill users—the ability to respond appropriately to perturbation—Fridland's focus on how such a capacity is instantiated in motor skills is too narrow. I argue that a broader account is needed, one that I offer in Sect. 4.

Before turning to such a positive account, I consider in Sect. 3.2 Fridland's arguments against Jason Stanley and John Krakauer's recent characterisation of skills (Stanley and Krakauer 2013; hereafter, S&K). Though she criticises S&K for making a strict separation between reason-responsive capacities and mechanical-like motor reactions, I argue that Fridland too makes a similar and troubling distinction between the non-automatic and discursively structured strategic control and the automatic structures of attentional and motor control. Far from being an initial prompt or a gloss of a performance (e.g. the teacher's instruction to 'bend your knee like this!'), propositional knowledge can play an integral role in the fluid deployment of skills by focusing one's attention on certain aspects of the task environment. Such 'discursive cuing', I suggest, puts pressure on Fridland's argument that strategic control 'does not automate' because it is too course grained and general to guide performance in real-time.

I will suggest that this argument is flawed insofar as it aligns discursively structured knowledge with non-automatic, general features of environments and skill requirements. While Fridland is right to be critical of the separation S&K make between knowledge and action as involving two different processes—what I call a 'prompt and play' account of skills—her account of control makes a similar mistake, separating knowledge and action in virtue of the kinds of processes they are involved with, non-automatic and automatic respectively. As I will show, the heuristic values of such distinctions are offset by the way they obscure fruitful uses of propositional knowledge in skill deployment. In Sect. 4., I offer an account, which, I argue, does not foreclose the possibility of propositional knowledge playing such roles.

3.2 Propositions, attention, and cuing

Jason Stanley and John Krakaeur have recently defended an intellectualist account of the role of knowledge in skilled action (Stanley and Krakauer 2013). According

to S&K, traditional accounts of skill have mistakenly taken the motor component of skill, what they call motor acuity, to be *constitutive* of skills[6]. However, empirical and clinical results suggest that the deployment and on-going use of skills requires a stock of knowledge-that, particularly knowledge-wh (knowledge-what, knowledge-where, knowledge-why) that articulates the appropriate circumstances for the deployment of skills, and which is employed to prompt the execution of the motor component of skills in order to satisfy intentions.[7] According to S&K, to truly have a skill and be able to use it, one needs not only have the brute motor abilities involved in skilled behaviour, but also knowledge about the organisation of the task, how to initiate action, and what successful action consists in. Only with the combination of knowledge and motor abilities can one know what appropriate motor ability to deploy in any given situation and, indeed, have the ability to deploy them. This account of S&K can be usefully deemed a 'prompt and play' account: once knowledge prompts the deployment of skill, it unfolds in a mechanical and formulaic way.

Fridland is rightly concerned with this 'hybrid' account of S&K's, and the way it "[combines] guidance by propositional knowledge with basic, mechanistic, subpersonal motor and perceptual abilities" (Fridland 2014a, p. 10). The account seems to fail in accounting for the way in which skills are both quick and reliable. Skill-users often respond in unrehearsed and creative, yet appropriate ways. To give an impressionistic, though not perfect example, consider the occasional sensational use by the tennis player Roger Federer of the 'tweener' shot: unable to get behind the ball to make a forehand or backhand return, Federer has sometimes employed a shot where he hits the ball *backwards through his legs*.[8]

I suggest that it is hard to characterise the creative deployment of skills as the formulaic unfolding of mechanical motor abilities, executed by the prompting of some knowledge-wh. Instead, such instances seem to consist in a surprising and ingenious combination of skills that together make the best of a (perhaps heretofore unseen) situation.

Situations involving unrehearsed but appropriate behaviour seem to go unaccounted for in S&K's account: in these situations, agents do not have the requisite knowledge-wh, yet still manage to act intentionally and appropriately. And such situations do not seem to be unusual: tennis players execute a number of strange shots taken from contorted positions that they seemingly come up with on the spot—do we want to suggest that these behaviours have been prompted by knowledge-wh? On S&K's account, the flexible and creative use of skills by experts would seem to require an extremely large and broad set of such knowledge-wh; a set that would account for all the minutia of an expert's performance.

There are some indications that this strong intellectualist account — where all of skill is to be accounted for in terms of a stock of knowledge-wh—is what S&K have in

[6] I follow Fridland in taking S&K's use of 'abilities' and 'acuity' to be interchangeable in this context.

[7] See Carter and Pritchard (2014) for a sceptical evaluation of Stanley's argument that knowledge-wh can be incorporated into the category of knowledge-that. See also Fridland (2012) for a more developed arguments against S&K's intellectualism.

[8] The most sensational 'tweener' I can think of is Federer's return to Novak Djokovic in the semi-finals of the 2009 US Open.

mind. They state: "We should […] emphasize that use of knowledge to select actions continues in the skilled state because there is always the possibility to perform new actions based on further knowledge" (Stanley and Krakauer 2013, p. 9). While such a strong intellectualist account cannot be ruled out *a priori* as impossible, it seems doubtful, and, in any case, S&K would owe us an explanation for how it is that one can have knowledge that prompts the use of new or otherwise unrehearsed and creative motor routines.

The other component of S&K's hybrid account, motor abilities, also seems unable to account for the quick, reliable, and occasionally creative deployment of skills. For S&K, motor abilities consist in relatively fine-grained and formulaic motor procedures that increase in precision through practice (p. 9). Definitionally, this seems to put the onus of reliability and creativity on the skill user's knowledge-wh, about which I have just voiced scepticism.

Further, S&K's account seems unsuitable when attempting to address the overarching concern of this paper: why experts continue to practice, and what structures are implicated in the ability to respond to perturbation. For experts seem to do more than improve their stock of knowledge and the precision of their motor abilities when they practice. As Fridland states, "if [according to S&K] all there is to skill is propositional knowledge about how to initiate and perform a particular action plus the possession of the motor and perceptual acuity to do it then the intelligence of skill will be identical to the intelligence of unpracticed, intentional actions" (Fridland 2014a, p. 2743; See also: Fridland 2012). But not only does attentive practice seem to improve the reliability of skills, it also seems to allow for increased appreciation of one's own skilled behaviour, and for the kind of creative deployment discussed above.

I agree with Fridland that S&K's characterisation of the relationship between knowledge and behaviour is unsatisfying. But so too is Fridland's characterisation. Fridland, like S&K, seems to demarcate the reason-responsive processes that characterise knowledge, and the motoric processes of behaviour. Whereas S&K make this distinction in terms of the nature of the processes themselves, Fridland's demarcation results from the role of *automaticity* in her account. For Fridland, attentional control and motor control are *automatic* in the fluid and flexible deployment of skills: they function without conscious intervention. By comparison, strategic control, the reason-responsive capacity to construct strategies and implement tactical decisions "does not automate" (Fridland 2014a, p. 2745). Fridland's argument here is that these reason-responsive, propositionally-handy capacities do not automate because they are "concerned with the global, non-domain-specific features of a performance." (*Ibid*) Fridland offers the example of energy management: during extended tournaments with a large number of games, athletes need to know how to manage the future state of their energy and fitness. Such global features further, are precisely the kind of things that a propositionally structured strategic control can reason about, but which attentional or motor control are not apt to handle.

But Fridland's chosen role for strategic control, in reasoning about how best to deploy skills over time, seems to miss a prevalent use of propositional knowledge in cuing behaviours during the deployment of skills. What I call *discursive cuing* involves the deliberate re-orientation of attention due to automatic, rehearsed propositions. Consider here Montero's (2013) recent work on the way in which discursive practices

may be an entrenched feature of the expert behaviour of ballerinas. Drawing on her own experience as a professional dancer, Montero suggests that ballerinas often employ sub-vocal utterances during both rehearsal and performance. Such sub-vocal utterances like 'remember to keep your arm up, here!' or 'keep those ronds de jambes smooth the whole way through!' are diectic cues that focus dancers' attention on relevant aspects of the environment and of skill-deployment.

I suggest that this is a specific instance of a more general phenomenon discussed by Clark (1997, 2008). Clark suggests that experts are 'doubly expert': "they are expert at the task at hand but also expert at using well-chosen linguistic prompts and reminders to maintain performance in the face of adversity" (Clark 2008, p. 48). Clark gives the example of the way in which expert players often encourage themselves to perform at their peak. This kind of internal cheerleading is similar in kind to Montero's positional reminders, and other kinds of 'instructional nudges' discussed by Sutton (2007). I suggest that *discursive cuing* is a handy catch-all phrase that captures the way in which propositional knowledge can function via sub-vocal utterances to focus attention. Such cues act as context-sensitive guides, orienting the performer to salient aspects of the environment and of an on-going skilled performance.

The important thing to note here is that discursive cuing straddles the automatic/non-automatic divide. The actual triggering of the discursive cue can be automatic, the result of continuous recitation of the phrase during practice. In this sense, they can be "automatized into routines that run in the absence of explicit attention" (Fridland 2014a, p. 2745). But such routines function by being conspicuous: the discursive cue causes a focusing of attention because one notices or utters a phrase *here*, *at this time*.

I suggest then, that Fridland's separation of reason-responsive capacities from behavioural capacities by means of automaticity does not work: in both practice and performance, skill-users can employ propositional cues and prompts that keep skilled behaviour on track. Strategic control cannot neatly be distinguished from (at least) attentional control. But one might also worry about the distinction between attentional control and motor control: part of what it means to be an expert athlete is to have very fine-grained discriminations about how skills are to be deployed, but this certainly means that one will have to be oriented toward the deployment of motor control. The skilled hockey player has to pay a great deal of attention to how the puck sits on her stick in order to make a satisfying wrist shot, and the gymnast has to have a great sense of the positioning and stability of her limbs in order to do her acrobatic routines. In such situations, it seems, attentional control collapses into motor control.

These reflections suggest that things are much messier and murkier than Fridland's account indicates: one cannot mark out reason-responsive capacities from other capacities in virtue of whether or not they are automatic, and further, Fridland's features of control may overlap and be functionally co-extensive at various instances. This suggests that Fridland's features of control are best seen as heuristic aids in characterising various features of skill deployment, and thus are not clear-cut categories reflecting real constitutive structures of skills. I will suggest in Sects. (4.1–4.3) that we should generalise these heuristic features into a more encompassing account.

But I also think that the phenomenon of discursive cuing points to another difficulty in Fridland's account. She seems to discuss *control*—the structures and processes that allow for appropriate responses to perturbation—in terms of how it responds to problems in the task environment. But if we buy into Clark's idea that part of what expert athletes do is motivate themselves to work harder, to push more, to grab opportunities when they are presented, we seem to end up with a very different picture of *control* than merely 'keeping things in bounds.' Instead, part of the robustness that control points to is *opportunistic*; in addition to motivating themselves, skill users are able to seize on chance moments and novel possibilities to respond in creative, unrehearsed ways.

3.3 Semantic skills

A particularly striking limitation of Fridland's characterisation of the capacity to accommodate perturbations is that it only accounts for this ability in *motor skills*. But our use of the term 'skill' seems to refer to a general class or category of behaviour, which encompasses a number of subsidiary kinds. Here I contrast Fridland's control with a category of skills I call *semantic skills*. These are skills that involve the manipulation of vehicles of semantic content, such as when writing, speaking, or reading. I then show that Fridland's notion of control does not have the resources to characterise the kind of accommodation to perturbation we see in semantic skills. Thus, while Fridland is interested in characterising of the ability of skill users to respond appropriately to disturbances—the capacity improved by attentive practice—and takes such a capacity to be constitutive of skills, her focus on motor skill belies the general nature of such a capacity, and, further, her account of control is not flexible enough to account for all actualisation of this capacity in skilled behaviour.

Consider a comedy improviser. I contend that an excellent comedy improviser—one who is very good at eliciting laughs, who easily finds the right moment to jump into the routine, who has the ability to think quickly on the spot—demonstrates a wide variety of difficult-to-master, context-sensitive skills. Fridland's control seems inadequate to characterise the acquisition and deployment of the skills possessed by this comedy improviser. Though such an improviser must selectively attend to aspects of the environment— riffing on previous jokes, picking up on opportunities for well-timed remarks—it seems hard to characterise such selective attention as *automatic*. Instead, the comedy improviser must always be attending to the various aspects of the ongoing scene, constantly evaluating what to say and when to jump in. Further, she is attending to the semantic content of situation, sub-vocally testing out various jokes and one-liners that she thinks would be humorous—rejecting some and using others. But because of the open-ended nature of comedy improvisation, because she has to attend to the changing context and semantic content of her co-actors, attentional control is not something that could automate for this improv comic.

The feature Fridland calls motor control also seems a poor fit: there just doesn't seem to be a good analog when it comes to characterising the skills of the comedy improviser. What would motor control consist in here—the ability to know when and what body position to take? What funny face to make? Perhaps, but we know that a comedic

'straight-man', someone whose emotional performances are muted for comedy effect, could also be an excellent comedy improviser. We might also think of an insult comic at this point: a good insult comic functions by making a number of lightning-quick responses and quips that don't really seem to require motor sensitivities at all (and they may also lack other sensitivities, perhaps social ones).

Finally, comedy improvisation seems to contrast strongly with strategic control. What would it mean for the improv comic to have a 'strategy' or 'plan'? It certainly couldn't mean that the comic had her performance planned out in advance, or that she has a clear sense of the way in which the performance will or should develop. Though there might be some kind of direction to her performance, the open-ended nature of improv comedy is subject to all sorts of strange and zany interventions that confound strategies for the deployment of skills. The improvised comedic performance, I contend, lacks the overarching teleology of most sports and motoric activities that Fridland uses as examples. In situations like comedy improvisation, it's not clear that one can construct strategies and tactics in the manner of her 'strategic control'.

So Fridland's control seems ill-poised to account for comedy improvisation. I suggest that it will similarly be ill-poised to deal with those skills that involve the employment of *semantic vehicles*, such as printed or typed words, verbal utterances, graphs and plans, and the like. Control will fail to account for these kinds of skills, I suggest, because of their open-ended nature, and because such skills do not have an essential motoric component[9]. Paradigm cases of such open-ended semantic skills are the ability of poets to skilfully arrange (both physically and sequentially) words on a page, the ability of the philosopher to analyse and decipher arguments, and the ability of architects to interpret and visualise architectural drawings.[10]

We might think that Fridland's account might still be applicable here by arguing that semantic skills merely differ from motor skills in the way they selectively emphasise the different structures of control. For instance, in athletics, we might argue there is a great deal of motor control and (perhaps) less strategic control, whereas in the crafting of a poem there is a great deal of something like strategic control and very little motor control. Aside from worries about how one might quantify and compare these different aspects of control, whether or not these various structures are clearly demarcatable, and whether or not the features Fridland characterises can be straightforward imported to deal with semantic skills, I think we can reject such an argument. In many semantic skills it is not that there is a contrast with motor skills in the amount of motor control

[9] I will not have more to say about the 'open-ended' nature of semantic skills here. I suggest that the 'open-endedness' pointed to actually picks out two relatively distinct and large issues: the role and prevalence of creativity and imagination in skill deployment, and the way in which individuals can appropriately switch between skill-sets and associated understandings of situations. The former issue is intuitive; the latter is more complicated and difficult to see. It is related to the problem that has recently been discussed as 'context-switching'; how individuals determine what particular skill (or combination of skills) should be employed to best satisfy our dynamically shifting goals (Wheeler 2008; Kiverstein 2012). I am grateful to an anonymous referee for pressing me on the nature of this claim.

[10] Some of the examples I have employed here, including the visualisation of architects, seem to implicate another kind (or perhaps, dimension) of skills: those that involve *expressive* or *aesthetic* behaviours and evaluations. I will have little to say about the role of the aesthetic with regards to skill, only here suggesting that skill is likely characterised along a number of dimensions, and that the various kinds of skills are likely to clump together in regions of this multi-dimensional space.

employed: it is simply that any particular motoric component is non-essential. One can verbally dictate poems, write them out longhand, or tap them out in morse code. We might even think the potential in so-called brain-machine interfaces, where various robotic or virtual tools are manipulated by thought alone, might rule out the necessity for any motor component whatsoever (see: Clark 2007). Motor control and particular motoric components do not seem to be necessary for semantic skills because such skills are not tied to any particular motor implementation.[11]

Let me reiterate the argument: Fridland's features of control are supposed to characterise the structures involved in the capacity of skilled individuals to respond appropriately to perturbation. However, her characterisation seems to be focused on how this capacity is instantiated in motor skills. I have suggested here that this characterisation will not generalise to capture how other skills accommodate in response to perturbation. Despite these criticisms, however, I do think there is a great deal of merit to Fridland's account. In Sects. 4.1–4.3, I argue that her account can be abstracted into two general principles that capture its spirit, if not its specifics. This allows us to make substantive comments about the general characteristics of the category of skill as a whole.

4 Rescuing control

4.1 Opportunistic robustness and normative sensitivity

In what follows, I suggest that we should replace the Fridland's *control*, as a way of explaining the ability of skill users to appropriately respond to perturbation, with two more general characterising features of skill: *opportunistic robustness* and *normative sensitivity*. I argue that these characteristics pick out general features of the overall category of skill: they are evidenced in the skilled humanities scholar who is an expert at breaking-down arguments and writing sharp and effective responses, to the skilled orator who can deliver a convincing speech to a rapt audience, and finally, to the case that impresses Fridland, the skilled athlete.

4.2 Normative sensitivity

Hubert Dreyfus's account of skill comes up for some particularly harsh treatment by Fridland. He is accused of giving a mere phenomenological gloss on the deployment of skill, rather than articulating the structures of skills and explaining how they arise and are used. Further, he is accused not only of missing, but of being fundamentally unable to explain the ongoing development and maintenance of expertise through practice. For Fridland, Dreyfus' characterisation of skill as 'absorbed coping' shifts the brunt of the explanatory burden from the realm of intentional explanation to subpersonal,

[11] This is an argument from *multiple realisability*—one can perform the same task, of shuffling semantic vehicles or tokens, in any number of ways. Note however, that this is different from the way in which *multiple behaviours* might serve the same teleological role in achieving the satisfaction of desires or the achievement of goals.

automatic mechanisms of Hebbian-style learning.[12] This, she thinks, is unacceptable. Yet, if Dreyfus is right that experts are "non-thinking non-calculating, and non-rule-following," when they are in the state of 'absorbed coping', Fridland is right to ask how it is on Dreyfus's account that experts "do all the fancy things that they do?" (Fridland 2014a, p. 2734) Fridland wants an account of skill to do real explanatory work, which means showing how lower-level structures can interact and engage with intentional processes to realise the amazing feats of experts.

Fridland is right to criticise Dreyfus, but I think that she is hasty in her whole-cloth rejection of his account. The first thing to note here is that Dreyfus's characterisation of skill and skill acquisition is deeply intertwined with his exegesis of Heidegger, Wittgenstein, and Merleau-Ponty. As such, it is tangled up with the way that skills feature as a part of an existential-phenomenological framework. Often, Dreyfus's explanatory interests are at cross-purposes with those of philosophers such as Fridland who are interested in causal and structural accounts of how bodily and intentional causes together explain skill acquisition and deployment. To the extent that these two interests converge in Dreyfus, it involves taking existential-phenomenological structures as incumbent on any causal-mechanical account of human capacities to accommodate[13]. As I see it then, Dreyfus is predominantly interested in articulating and demonstrating how an agent's understanding of the world (which certainly involves skills) allows for the acquisition and appreciation of—and manoeuvring within—the normative aspects of situations (See, esp.: Dreyfus 1991, 2007a).

This is not to let Dreyfus off the hook: Gardner has convincingly argued that Dreyfus often slides from making transcendental arguments about the role of skills into arguments about the necessary constitution and structure of our cognitive apparatus (Gardner 2013). To the extent that Dreyfus takes authors such as Heidegger and Merleau-Ponty to be offering a picture of how skill is instantiated in human brains, he may be misappropriating the transcendental tradition these authors represent. This is not to say that a causal-mechanical account of skill based on Dreyfus' considerations would be wrong or unrealistic[14]; just that the inspiration and justification of such an account would involve distortion. I also agree with Fridland that Dreyfus's characterisation of skill leaves much to be desired. His account of 'absorbed coping' holds that when individuals are employing their skills to the utmost they completely 'merge' into the activity. In such a state, any mental activity at all is disruptive—so experts,

[12] See: Fridland 2014a, p. 2735. For a response to this line of criticism against Dreyfus, see: Rietveld, 2012. As Rietveld sees it, Dreyfus's employment of the term 'Hebbian' does not implicate a process of hard-wiring, where neural wiring would serve as the subvenience base for something like a psychological disposition. Instead, Dreyfus's remarks in this context should be taken to be a rough description of the dynamic process that partly realise flexible and fluid skill deployment together with bodily and environmental structures. A potential sub-personal processing account that Dreyfus points to here is Walter Freeman's *neurodynamics* (Freeman 2000).

[13] This should not be taken to suggest that Dreyfus has not engaged with causal and structural accounts of human capacities like skills. Indeed, both the accounts of Dreyfus and Dreyfus (1980, 1986) and Dreyfus (1972) were sustained criticisms of the GOFAI (Haugeland 1985) approach to capturing the intelligent, goal-directed behaviour of human beings. I thank an anonymous referee for pushing me to be clearer on Dreyfus' engagement with cognitive science.

[14] See, for instance, Freeman (2000) and the remarks in Dreyfus (2007b) for on such potential development of Dreyfus' view of skill.

when they are truly using their skills, are mindless (Dreyfus 2005,2007,2013). This account is at loggerheads not only with the account offered by Fridland, and here by myself, but an increasing amount of empirical and philosophical reflection (Montero and Evans 2011; Zahavi 2013)[15]. Nonetheless, I think Fridland's almost exclusive focus on a single article of Dreyfus's, when he has written so extensively on this issue, is somewhat uncharitable[16].

In contrast to Fridland's dismissal, I think that the normative aspect of Dreyfus's account is useful, and does give us a clue as to how skill acquisition and development work. It also gives us the tools to articulate what it is that experts constantly refine in practice. Such a normative account is evident when he speaks of "the gradual refinement of responses that grows out of a long experience acting within […] shared cultural practices" (Dreyfus 2000, p. 162). What does such a claim consist in? Dreyfus suggests that what one needs to achieve such gradual refinement is "a motivation continually to improve," which consists in "both the willingness to take risks and a commitment to excellence that manifests itself in persistence and in high standards for what counts as having done something right. One must also be sensitive to the distinctions in the relevant domain" (Dreyfus 2000, p. 171). One example given by Dreyfus of 'continually improving' and of the commitment to excellence is the way in which musicians can cultivate their sensitivity to pitch, eventually achieving perfect pitch (Dreyfus 2000). What Dreyfus is gesturing at here, I suggest, is that human beings have and can develop subtle discriminatory responses to meaningful phenomena in the world—even if those phenomena are the arbitrary classifications of tones in European musical traditions.

The kind of structured sensitivity Dreyfus has in mind here is, I think, best spelled out in terms of Rietveld's (2008) notion of *directed discontent*. Directed discontent characterises the way in which skilled experts are able to make innumerable sensitive, fine-grained discriminations of both errors (including potential errors) and opportunities for action. Consider Rietveld's example of the architect: "When the architect sees that the door is too high, he is certain that the door is not correct 'like this.' He can instinctively express, gesture or say 'Too high!', without necessarily having in the back of his mind some explicit goal, for example, that the door should be 14.8 ft. high" (Rietveld 2008, p. 981). What this example draws attention to is not only the various ways in which someone can evaluate and point to something as disconcerting, but what such discontent consists in: something in the world *could be better*. Directed discontent is a felt normative evaluation of situations in the world.

Of course, such normative reactions are not only manifested in situations we might broadly call 'ameliorative', that is, situations where things call out for improvement. They are also manifest in opportunistic situations where one has to seize opportunities,

[15] See especially the numerous studies cited in Montero and Evans 2011. There, they exhaustively demonstrate that one of Dreyfus's flagship examples, chess, is not adequately characterised as mindless: expert chess players utilise a number of deliberative, calculative processes while playing.

[16] That is, Dreyfus 2002. But see also Dreyfus (2005) for claims of a similar nature. For a more complete characterisation of Dreyfus's account of skill, one would need to detour into his detailed exegesis of Heidegger, Wittgenstein and Merleau-Ponty (i.e. Dreyfus 1972, 1991, 2000, 2006, 2007a, b, c). This, unfortunately, is beyond the scope of this article.

as I discussed in Sect 3.2. When an expert hockey player notices that part of the net is not covered by the goalie, she is drawn to take the shot. Being drawn here consists in an evaluation of the context—one that leads to further action. It is this ability to respond pre-reflectively to the normative aspect of tasks, I contend, that Dreyfus has in mind when he talks about the 'affective fields of forces'[17] that solicit behaviour from experts. Dreyfus is not attempting with this phrase, I suggest, to give a causal explanation of how skilled behaviour is actually functioning, but instead how normative evaluations and appraisals can have motivational force without the interjection or reflection upon rules. So, insofar as Dreyfus is concerned with 'non-thinking, non-calculating, non-rule-following' experts, he is interested in characterising the way in which we can have *pre-reflective normative sensitivities* that motivate us to act[18].

What an expert develops in practice, I suggest, are *normative sensitivities*. In attentive practice, one learns to selectively discriminate among innumerable deeply contextual aspects of skill deployment. This kind of sensitivity and its satisfaction, I contend, is what experts are getting at when they say that things 'feels right'[19]. This is also why an account like S&K's that relies on rote rehearsal, emphasising the *precision* of skill deployment, flies wide of the mark: one doesn't merely improve how skills work in their deployment, but also one's ability to evaluate the situation, and, as I will suggest in the next section, to react accordingly[20].

Here I have suggested that what practice develops is the ability to refine one's sensitivities—to hone one's evaluative capacities. Practice allows one to see what is right, wrong, and what could go right and wrong. It provides and increases one's stock of normative sensitivities—things that can be appreciated, that are frustrating, that seem wrong, that are ripe for the picking. They are what enable the expert "to see what should be done to improve the current situation or solve the problem; to perceive and act on possibilities for action" (Rietveld 2008, p. 980).

[17] For example, in Dreyfus (2013, p. 21). A related phrase is used through Dreyfus's corpus. In Dreyfus and Dreyfus 1986, this is called a 'world of opportunities' (p. 30).

[18] Such a pre-reflective account of skills and understanding is caught up with Dreyfus's exploration of Merleau-Ponty's notion of *motor intentionality*: a characterisation of intentional engagement with the world that does not make recourse to mental representations of beliefs, desires, and goals (Dreyfus 2007c; Merleau-Ponty 2012; Wrathall 2005). While I think that the account under development here somewhat speaks to truth of motor intentionality, a fuller discussion of the structure of intentionality, and how my account weighs upon it, would go well beyond the considerations of this article.

[19] Do mathematicians and logicians develop normative sensitivities, and correlated affective sensations? Despite the fact that mathematicians and logicians employ rule-governed structures, they can do so in a variety of ways. Understanding what makes deployments of mathematics or logic elegant and sophisticated (as in proofs) is what development of normative sensitivity consists in for such domains. Thus contra Dreyfus and Dreyfus (1986), I think there are many interesting things to say about the skills and skill acquisition in 'structured' areas like mathematics. I thank an anonymous referee for raising this issue.

[20] There is more to be said about the relationship between propositionally structured knowledge and intentional, skill-governed action (i.e. Fridland 2012). Suffice to say, many authors impressed by the work of Merleau-Ponty are sceptical of the full-blown intellectualism of S&K, and suggest that motor intentionality is a more phenomenologically on-key structure that explains skilled behaviour that need not make any recourse to propositions or rules (See, *inter alia*, Wrathall 2005). However, as I have suggested with discursive cuing, such hard and fast separation between propositions and skilled behaviour might be too simplistic.

So how does this bear on Fridland's account? I suggest that we see that normative sensitivities are developed in various domains at different levels of grain. We can analyse and understand various processes in virtue of the way in which they are selectively sensitive to the normative character of the situation: whether it involves sifting and sorting among reasons employed in particular situations, learning where the informationally-rich 'environmental arrays' are in the world and how to orient toward them, and learning the various sensations that are indicative of problems. That is, we can understand various structures and processes in virtue of how they help satisfy the abstract role of being sensitive to the normative aspect of situations.

Despite arguing that all Fridland's structures of control employ normative sensitivities, I do not think that this collapses normative sensitivity into attentional control. As I hope the considerations above show, it is not clear that the normative sensitivity involved in different aspects of skill performance should be treated as a unitary phenomenon: the capacity to pick up on the normative character of the world seems importantly different when considering our reason-responsive capacities as compared to considering our ability to notice slight differences in the flow of sensation. Nonetheless, I think that we can characterise such capacities in terms of the abstract role they play: as involved in generating affective responses to the normative character of the world[21].

I contend that cashing out the development and maintenance of skills in terms of normative sensitivities is the start of a more general and satisfying characterisation of the ability of skill users to maintain skill deployment and to respond appropriately when disturbed (See: Sect. 4.4 for a more comprehensive comparison between Fridland's account and my own). While Fridland is right to point to the fact that we can be selectively sensitive in a motoric way, learning how to move one's body *just so* when encountering *this particular* situation; I here suggest that we need an analogous account for the normative evaluations and ameliorations that go on in the skilled poet or the skilled comedian —how to be sensitive to the various ways one can manipulate one's words and intonation *just so* to accomplish *this particular effect*.

4.3 Opportunistic robustness

Normative sensitivities are not the whole answer as to what is developed and maintained in attentive-practice. We also need to account for the aspect of control that explains "the nuanced, particular, fine-grained modifications and adjustments that an agent manifests in skilled action" (Fridland 2014a, p. 4). What Fridland is arguing for here, I suggest, is that controlled skill does not merely consist in 'micromillimeter, microsecond' motor adjustments. Rather, expert skills evince a kind of *robustness*. Skills, even semantic skills, consist in fine-grained sensitivities and attentive capabilities that allow for reliable, superior performance. Such reliable superior performance is actualised by both maintaining and developing skills, what Ericsson characterises as "stretching performance beyond its current capabilities […] while preserving other successful aspects of function" (2006, p. 698). I call this quality, where one is able

[21] I thank an anonymous referee for putting forward this objection.

to simultaneously maintain and improve the deployment of one's skills, *opportunistic robustness*.

Opportunistic robustness, as I envision it, is the counterpart to normative sensitivity (developed in Sect. 4.2). There I suggested that these sensitivities have the function of signalling that the situation could be *better* in some way—and that practice trains and adds to our stock of discriminatory capacities that get a handle on what is going wrong, what could be improved, and what opportunities could be seized. Opportunistic robustness, I suggest, consists of structures and processes that satisfy such discriminations.

Such opportunistic robustness will play out differently with different kinds of skills, but as Fridland is right to point out, such robustness is often in play pre-reflectively (Zahavi 2005). Though one can often reflect on the minute movements or strategies that one employs in the actualisation of skills—perhaps rehearsing movements, and imaginatively running through scenarios in one's head—in the heat of the moment, the ability to respond to disconcerting aspects of the situation must happen quickly and fluidly.

Opportunistic robustness and normative sensitivity, I suggest, can only be made distinct in a heuristic way. Despite the fact that they are discussed separately here, they are, as it were, two sides of the same coin. Yet, this should not be taken to imply that they are always commensurate. Consider a deep and devoted fan of classical music who does not play an instrument herself: through many repeat exposures to orchestras (both live and recorded) she can discriminate between the different sounds of the instruments in an orchestra, as well as when these instruments are out of tune. Regardless of what she may know about how to tune such instruments (that flutes pull out their mouthpieces, that string instruments turn pegs) she will lack the robust skills needed by professional musicians to quickly and accurately tune instruments. Instead, her only means of responding to out of tune instruments or orchestras is by turning off the recording, or leaving the performance. So despite having very rich and well-developed normative sensitivities, her ability to respond to the situation is coarse—in fact, it is all-or-nothing.

Considering now the reverse relationship, I am suspicious that that one can have robust skills to respond to disconcerting aspects of a scenario without having some kind of (at least) pre-reflective normative sensitivity. I suspect this is what Rietveld means when he states that directed discontent "is affective and behavioural at the same time" (Rietveld 2008, p. 976). By training ourselves in the production of a certain skill or set of skills, we are likewise training a set of normative sensitivities.

4.4 Control, normative sensitivity, and opportunistic robustness

Here I propose that the combination of the two general characteristics I put forward offers an account that is more general, but at the same time more powerful, than Fridland's account of motor control. Not only does it allow us to see Fridland's strategic control, attentional control, and motor control as contributing to the way in which individual might respond to perturbation in a particular class of skill—*motor skills*—it also allows us to give diagnostic properties of skills as a kind that encompasses a

variety of heterogeneous classes. Specifically, it incorporates the *semantic skills* that I suggested could not be captured by her account (and perhaps others). At the same time, normative sensitivity and opportunistic robustness allows us to keep the *character* of motor control, i.e.: "that which accounts for an agent's ability to guide and modify her actions appropriately" (Fridland 2014a, p. 2732).

Let me attempt to be as explicit as possible about the links between my account and Fridland's. When it comes to motor skills, I suggest that we see normative sensitivity and opportunistic robustness as instantiated in each of the structures that she characterises: in strategic, attentional, and motor control. In both learning and attentive practice, one can develop the sensitivity to various aspects of the task environment and improve one's ability to respond to such sensitivities at each level of Fridland's account.

Take Fridland's example of Gabby Douglas, who won the individual all-around artistic gymnastics gold medal at the 2012 Olympic Games in London. When Gabby carries out her routine on the balance beam "she takes off with the right amount of force, she jumps backwards at the right angle, she arches her back to the right degree, she places her hands in the right location on the beam […] she executes her tumbling pass as she intended to. She is in complete control" (Fridland 2014a, pp. 2730–2731). I suggest that this is because Douglas is able to notice when situations are not ideal, perhaps "if her foot were to slip a touch on landing" (Fridland 2014a, p. 2731), and has the capacity to recover and ameliorate the situation. Here I suggest that such motor control exemplifies how normative sensitivities and opportunistic robustness are instantiated. Over many trials (both real and imagined) Douglas has developed felt sensitivities (perhaps to 'foot-slippage') and nuanced and subtle means of responding to such felt sensitivities to keep her gymnastic routine going.

Attentional control too demonstrates how normative sensitivities and opportunistic robustness can explain skill users' capacity to respond to perturbation. Attentional control aims at characterising how relevant information is noticed and exploited *in situ*: the ability of hockey players to notice undefended areas of the ice, tennis players to take advantage of weak backhands, and the like. The example of Gabby Douglas does not work especially well here for one of the reasons I gave above, as it seems like here attentional control collapses into motor control: Douglas' attention is focused on the way in which her motor routines are being deployed and how they will be deployed (where her foot will land on the beam, where her hands should be positioned, etc.). But in situations where attentional routines can be made distinct from motor routines—as in the case of hockey players who's gaze is keyed to look at defensive or offensive positions—we can see that such routines are also instantiations of normative sensitivity and normative robustness. Attentional control is developed by increasing the number of informative, environmental arrays one is sensitive to— by developing the sensitivities to where important information lays, and routines and strategies to orient towards them.

Finally, strategic control consists (at least) in the ability to reason about possible outcomes, link together tactics, and, as I've suggested, employ discursive cues. Such reason-responsive capacities, it shouldn't be surprising to note, can be improved by recognizing the relevance of various sources of information, reconfiguring one's tactics and strategies over time, and employing a number of prompts and mantras. Gabby

Douglas, for instance, has developed the ability to reason about how best to allocate her energy on the four events of the individual all-around, utilize propositional cues to keep her performance at a high level and to motivate herself to succeed[22], as well as recently, to reason about which coach is best able to analyse her movements and help her further her career. Such instances of strategic control, I suggest, are best seen in terms of how they are developments of sensitivities to reasons, and the ability to employ these reasons in an appropriate way to realise the satisfaction of goals. Strategic control too is well characterized by seeing it as a specific instantiation of normative sensitivities and opportunistic robustness.

So Fridland's control seems to be captured by the two more general characteristics I've put forward. Each of her levels of control are instantiations of structures that exhibit felt recognitions of situations in the world, and motivational pushes to improve or exploit the situation in some way to keep skill deployment on track. But to show that my two characteristic features of normative sensitive and opportunistic robustness are a good characterisation of skilled behaviour *tout court*, even semantic skills, consider an expert philosopher: Not only is she able to sort out the essential components of the argument from the rhetorical filler, she is able to notice the weak point in deduction, or the error in judgement. Utilising other capacities and skills, she is able to construct and convince others of this misstep in reasoning, or the way in which her account is more convincing than others. Further, she is able to employ this skill in a wide range of formats (analysing power-point presentations, grading undergraduate essays, listening to oral arguments, etc.). The generality of her skills certainly plays a role in being able to apply them to a wide variety of philosophical formats—but here it is in the reliable ability to perform well, *despite* the variety in the semantic vehicles being utilised, in which her skill consists. Consider again the architect. She is able to tell, in a wide variety of architectural situations, what is and is not correct—and she can take steps to ameliorate such a situation. Her skill here consists in the wide variety of situations in which she is able to provide and offer correctives and improvements.

When it comes to semantic skills, opportunistic robustness and normative sensitivity consists not merely in being reason-responsive, but in being able to selectively attend—to determine which reasons are important—and to use them appropriately. It consists in being able to ameliorate one's position, and knowing when to make risky decisions and to seize opportunities. Just as in motor skills, the opportunistic robustness of semantic skills develops, I suggest, by developing the normative sensibilities I introduced under the moniker of directed discontent. Directed discontent is an evaluative and motivational *push* that generates behaviour. In directed discontent, a stock of fine-grained discriminations to which we are sensitive, guides fine-grained control over the situations in which the skill applies (Rietveld 2008).

[22] Douglas suggests, at qualifiers for the United States of America's national gymnastics team, during a slip on a performance she thought to herself: "Okay, yeah just grab the bar and just finish this routine, and kind of don't make it a big deal." Though we should rightly be suspicious of such post-hoc rationalizations and phenomenological reports, it seems likely that Douglas *could have* uttered something akin to this during her performance. Insofar as Douglas did, in fact, utilize a discursive cue like the one above, I suggest it is aimed at keeping at bay a number of over-reactive affective evaluations. In effect, such a cue aims at modulating emotional responses, which might lead to feelings that *everything* is going wrong. (See: Stranahan 2013).

5 Conclusion

Fridland's account of *control* is a perspicacious one. With it she has highlighted various features and structures that have been erroneously underemphasised or indeed are entirely missing from contemporary discussions of skill. Further, she has pointed to several characteristic features as marking out structures experts can continually improve through attentive practice. However, I have argued that Fridland's account is unduly restrictive. Despite aiming at characterising a general capacity of all skills, it seems to arbitrarily focus on motor skills, and rules out whole classes of skill. Further, it rules out the possibility that discursive practices can play a positive role within the execution of tasks, for example as a way of cuing, a reminder to pay attention to select aspects of a scenario.

I have suggested that the way out of these worries is to see *control* as an instantiation of two more abstract characterising features: normative sensitivity and opportunistic robustness. These features are general characteristics of skills, and point to the kind of abstract structures that allow an agent to respond to perturbation, and which are improved through attentive practice. Though one can train normative sensitivities without a correlated increase in the richness of robust responses (as the example of the dedicated music listener shows), attentive practice or training in the production of skill—whether such practice takes place in the medium of writing, or music, or dance, or athletics—consists in the development of both.

Returning to one of the examples above: why is Angela Hewitt's performance of Bach's *Goldberg Variations* so much better than mine? Her performance is better because she has developed fine-grained determinations (much finer than mine) that are reliably and robustly invoked in the deployment of her skill. She is drawn to act through normative and motivational sensitivities, coupled with reliable and robust strategies for noticing, responding, and seizing upon relevant phenomena in the deployment of skill. She's probably practiced a whole bunch more.

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