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Adaptive abilities

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Abstract

Abilities, in contrast to mere dispositions, propensities, or tendencies, abilities seem to be features of agents that put the agent herself in control. But what is the distinguishing feature of abilities vis-à-vis other kinds of powers? Our aim in this paper is to point, in answer to this question, to a crucial feature of abilities that existing accounts have tended to neglect: their adaptivity. Adaptivity is a feature of how abilities are exercised. The main reason for its relative neglect has been that most extant accounts have focused solely on whether abilities are exercised successfully in certain possible situations and have mostly understood the exercise of an ability in terms of complete successful performance. We begin by pointing out two aspects of abilities with regard to which current accounts seem (at best) incomplete: control and exercise. We then introduce adaptivity as we understand it, and end by putting it to work in developing a fuller understanding of abilities that does better than current accounts.

1 | INTRODUCTION

Abilities matter. Not only do they determine what options we have for action; they have also been appealed to in accounts of free will, knowledge, agency, and many other phenomena. Unlike mere dispositions, propensities, or tendencies, abilities seem to be features of agents that put the agent herself in control. But what is the distinguishing feature of abilities vis-à-vis other kinds of powers?

Our aim in this paper is to point, in answer to this question, to a crucial feature of abilities that existing accounts have tended to neglect: their adaptivity. Adaptivity is a feature of *how* abilities are exercised. The main reason for its relative neglect has been that most extant accounts have focused solely on *whether* abilities are exercised successfully in certain possible situations and have mostly understood the exercise of an ability in terms of completed successful performance. Sections 2–3 point out two aspects of abilities with regard to which current accounts seem (at best) incomplete because of their neglect of adaptivity. Section 4 introduces adaptivity as we understand it, and sections 5–6 put it to work in developing a fuller understanding of abilities.

The scope of our discussion is limited in three respects. First, we are only concerned with abilities and set aside the issue of how to understand related notions such as skill and know-how, as it is not clear how those notions relate to that of an ability.[1] (We will, however, note some parallels to our arguments in the literature on skill and know-how.) Second, we focus exclusively on *agentive* abilities, or abilities to perform certain actions. While we believe that our account can shed light on other abilities, in particular cognitive abilities, too, we do not discuss those here. Third, like most philosophers writing on abilities, we are interested in a robust notion of 'ability' which includes, inter alia, the ideas of sufficiently reliable and controlled success (see, e.g. Kenny, 1976). There may be other uses of the word 'ability' (like Mele's notion of 'simple ability' in Mele, 2003), but we are not concerned with those.

2 | CONTROL

Abilities seem to come with a distinctive element of *control*: what we have an ability to do is something that is under our control or in our power. It seems that this element of control is what sets abilities apart from other powers or dispositions. The manifestation of our dispositions is often something that merely happens to us. When we manifest our dispositions to fall, to blush or to get angry, we are passively undergoing a change. When we exercise—or indeed refrain from exercising—our abilities to run, speak, or help a friend, we are active and in control.

It is this element of control that has created problems for a simple understanding of ability possession as a form of possibility, which would be initially suggested by the fact that we can ascribe abilities with the modal auxiliary 'can' (Kratzer, 1977; Lewis, 1976). Possibilities need not involve the sort of control required for ability; for instance, anything that an agent does it was possible for them to do, but not everything an agent does is under their control and an exercise of their ability (Kenny, 1976; Loets & Zakkou, 2022; Kikkert, 2022).

Arguably the most influential attempt to capture the element of control has been the conditional analysis of abilities, going back at least to G.E. Moore (1911).[2] The conditional analysis understands abilities in terms of a (counterfactual) connection between our intending, trying, or deciding on the one hand and the resulting action on the other: to be able to φ is to be such that one would φ if one were to intend, try or decide to φ. Despite several counterexamples to the original version of the conditional analysis (Austin, 1961; Chisholm, 1964; Lehrer, 1968) it has spawned descendants that continue to think of abilities in terms of a conditional or counterfactual connection between volitional or conative states on the one hand, and the resulting behaviour on the other. Dispositional analyses (Fara, 2008; Vihvelin, 2004; 2013; Sosa, 2007; Greco, 2010) take abilities to be a special kind of dispositions, set apart from other more passive dispositions by the nature of their stimulus conditions: intending, trying, or other conative/volitional states. On the act-conditional analysis (Mandelkern et al. 2017) an agent, roughly, is able to φ iff there is an available action, ψing, for them such that if they were to try to ψ, they would φ. The success account

(Jaster, 2020) replaces the conditional with a proportional quantification over possible situations so that, where *φing* is an action, roughly, *x* has the ability to *φ* iff *x φ*s in sufficiently many situations where x intends to *φ*.

The appeal of conditional-type accounts is visible even in some recent revivals of possibility-based views of abilities. Schwarz (2020) construes ability ascriptions as statements of possibility but locates the distinctive element of control required for ability in the prejacent of the 'can' statement (the '*φ*' in 'S can *φ*'), which is understood as an action that the agent is warranted in believing she *will* perform *if* it is under her 'volitional control'. Willer (2021) instead locates control in the possibilities that are being quantified over: those are 'available actions', which are most readily attributed when we believe the "agent to have a good chance at succeeding in performing the relevant action, should he or she try to do it" (Willer, 2021, p. 556f.).

Despite their differences, these accounts all understand the control associated with an ability to *φ* in roughly the same way: as a kind of counterfactual dependence of the agent's *φ*ing on whether she has a conative/volitional state of the right kind. The agent, on this picture, can control whether she *φ*s because whether she does depends on whether she decides, intends or tries to do so.

It is our contention that this way of accounting for control is unduly one-dimensional: it captures only control over *whether* or not one *φ*s.[3] It does not capture control over *how* one *φ*s, and in particular, over *how one adjusts* one's temporally extended performance of an action over time. For this reason, conditional views and their descendants are best suited to, and most easily illustrated by, abilities to perform relatively basic and 'atomic' actions, such as raising one's arm, where the only relevant question may well appear to be whether to perform them or not. It is tempting to locate the agent's control, in such cases, just in the choice of *whether to initiate* the action in the first place and in the performance of the action depending on that choice. Even when there is a further question of how best to perform this action (i.e., whether to lift our arm to the right or to the left), this further question, it may well seem, can be put as whether or not we should perform an action of a more specific kind. Once the agent's input is given by her choice, it seems in such cases, the action proceeds to completion without any further exercise of control by the agent being required.

But this way of locating control looks much less plausible when we consider actions which are extended through time, and which we must control throughout their performance. We give a 45-minute talk, go on a one-day bike tour, or embark on long-term writing projects. These actions are exercises of our abilities, and our abilities to perform them provide us with a certain amount of control. But that control does not consist in the mere fact that if we were to intend to do those things, we would (most likely) do them. Rather our control also pertains to *how* we do those things, where this *how* is not fully settled by the content of our initial choice, but allows for changes in the course of the performance: we are responsive to our audience in giving a talk and shorten parts of the talk when we see that time is running short, conserve our strength on the bike tour, revise arguments for the paper we write, and so forth. This kind of flexible control over how we do things is characteristic of our agency, as Helen Steward (2012) has stressed, and has been argued to be at the center of skilled action more specifically (Fridland, 2014). It is also characteristic of the exercise of our abilities, and we would be hesitant to ascribe to an agent a full-blown ability, especially when it comes to abilities to perform complex actions, if, in their exercise, the resulting behaviour would be definitely and unchangeably fixed once the agent has made her initial decision about what to do. To use a distinction familiar from the philosophy of action, the agent's control must not merely pertain to the beginning of the action, but there must be 'guidance' control during the course of the action.[4]

While the need for continued 'guidance' is especially visible in actions whose performance takes longer, some kind of guidance is needed for any action whose performance is even minimally tem-

porally extended. Even raising one's arm takes some time and may require sensitivity to obstacles that block the arm's projected path, sensations of pain, and so on.

How could a conditional-typ view accommodate such guidance control? One strategy would be to point out that when an agent exercises guidance control, she typically breaks off one action and starts another: realizing in a supermarket that the milk is on the right-hand shelf, she may simply stop her action of moving to the left and start a new action of moving to the right. Guidance control over abilities might then consist of being able to stop the exercise of one ability and start the exercise of another. But this would leave the flexible exercise of our more coarse-grained abilities themselves unaccounted for: in the supermarket, we are exercising not only the ability to go left or the ability to go right, but we are also continuously exercising our ability to buy milk, and this exercise involves precisely the kind of adjustment or guidance control we have been looking for.

A second strategy would identify the more coarse-grained abilities with *bundles* of the more fine-grained ones: to be able to buy milk *just is* to have such abilities as the ability to turn right, to turn left, to take the milk from the shelf, etc. Abilities, following Vihvelin (2004, 2013), are not single dispositions but *bundles* of dispositions.

The view we will ultimately suggest will have much in common with this 'bundle' view. But we believe that without an additional story about what unifies such bundles and turns them into abilities such a view is at best incomplete and at worst incorrect. For not every bundle of dispositions constitutes an ability: The disposition to grow to a height of 1.80m, for instance, is presumably constituted by a bundle of more fine-grained growth-dispositions (pertaining to different organs and parts of the body), but is not an ability. What sets apart the ability-constituting bundles? We might say that the dispositions constituting it are themselves abilities (understood in the conditional/dispositional way). But then the question of control is merely pushed to the next level, for the exercise of those abilities should itself exhibit guidance control. Furthermore, not every bundle of (simpler) abilities constitutes a (more complex) ability: being able to push various keys on the piano does not make one a capable piano player. What is needed is a kind of organization of those simpler abilities that allows the agent to draw on those abilities in the right way in exercising the more complex ability.

None of this shows that the flexibility involved in ability cannot somehow be accommodated by conditional-type views. We merely wish to point out that something crucial is still missing—and we will later propose a way to fill this lacuna.

We conclude that those accounts of ability which most prominently incorporate the idea that ability involves control have accounted for that control only partially: in addition to understanding an agent's control over *whether* an ability is exercised, we need to understand control over *how* it is exercised.

3 | EXERCISE

To use somewhat metaphorical terms, the previous section has raised the complaint that accounts of abilities focus on the *beginning* of abilities' exercise: under what conditions an ability is, with a term from the literature on dispositions, triggered to manifest. In this section, we add the complaint that those accounts focus on the *end* of abilities' exercise: on whether or not the activity in question is completed. These two complaints complement each other. What is neglected in each case is the middle: how we get from beginning to end.

Less metaphorically, our complaint is this. On the accounts we have considered, the possession of abilities is understood in terms of their successful manifestation in certain possible conditions—such as the situations where we intend to manifest them, etc. If all there is to an abil-

ity to φ is an agent's φing in the right kinds of possible situations, then all we have at our disposal to understand the *exercise* of an ability to φ is the agent's successful φing itself. Thus these views naturally lend themselves to an account of ability manifestation such as the following (Millar, 2009, as by Carter, 2021, p. 2495):

> **Exercise-Success** The ability to φ is exercised or manifested if and only if one successfully φs.

But Exercise-Success is false. Consider two agents. Anna, an accomplished archer, shoots her arrow at a target. She does everything just right—but at the very last moment a gust of wind takes the arrow off-course, and Anna fails to hit her target. Bela, a complete novice, takes up her gear and has a go at the target. He tries to hit the target but has no idea how to do it. As a matter of pure coincidence, when his arrow goes off, it hits the target fair and square. These kinds of cases are well known, especially to epistemologists used to operating with Ernest Sosa's (2007) distinction between accuracy, adroitness and aptness.

Bela presents a clear counterexample to the right-to-left direction of Exercise-Success. To strengthen the condition, we might add that only certain types of success—for instance, intentional successes, or successes in 'normal' situations (Greco, 2010, p. 77) —count as exercises of the ability in question.

But Anna, too, is a counterexample to Exercise-Success, in its left-to-right direction: Anna did exercise her ability, even though she did not succeed. We grant that there may be a sense of 'exercise' in which she did not exercise her ability, but it seems clear to us that there is at least as good a sense in which she did. Anna did exactly what needed to be done to hit the target. She adjusted her posture in the right way, nocked her arrow in just the right way, applied the right force, and so on. And she did not do so by accident. It is precisely her ability to hit targets with an arrow that *explains* how Anna behaved and was in part *responsible* for her behaviour. This strongly suggests that exercise, too, is not merely a matter of *whether* the agent succeeds or fails; it is a matter of *how* they do so.

Note that, unlike Bela's case, Anna's is not resolved by adding further restrictions to Exercise-Success. Such restrictions only serve to rule *out* cases that should not count as exercises. What we need is a way of ruling *in* cases like Anna's.

Yet how are we to understand the exercise of abilities if not via Exercise-Success? This question has not received a great deal of attention, though, as Adam Carter notes, it is of major importance to all the areas of philosophy which are concerned with abilities or want to use this notion (Carter, 2021, p. 2496). Carter himself proposes an alternative view to Millar's:

> **Modal Coverage** When one φs, one's φ-*ing* constitutes an exercise of one's competence to ψ if and only if in a wide enough class of near-by worlds where, holding fixed both the subject's seat and shape in her exercise of her competence to φ in the actual world, the situational conditions are the relevant ones to ψ-ing, and the subject attempts to ψ, that attempt is (non-deviantly) successful.
> (Carter 2021, p. 2505)

Roughly, an ability (or 'competence') is exercised in any behaviour that is produced (in the right way) by the causal basis (the 'seat and shape') of that ability.

Modal Coverage does better with our cases than Exercise-Success, while using much the same resources: it looks at an agent's success rate across possible situations. Anna's failure counts as exercising her ability because it is produced by a mechanism that produces successes in "a wide enough class of near-by worlds; Bela's success does not because it is produced by a mechanism that does not.

However, it seems that Modal Coverage overgenerates. Compare the case of dispositions. Two dispositions can share a causal basis: a ball's round shape is the causal basis of both its disposition to roll down an inclined plane and its disposition to fit through a round hole. But in rolling down an inclined plane, we should not say that the ball has manifested its disposition to fit through a round hole. Facts about which dispositions are manifested are more discriminatory than facts about which dispositions' causal bases are implicated in a given causal process. We should expect the same thing for abilities.

According to Modal Coverage, any two abilities that share their 'seat and shape', i.e., their causal basis, will always be exercised together, and similarly for many abilities where one ability's 'seat and shape' is part of the other's. Carter himself illustrates the point with a case of being able to do one thing by doing another: assuming that he has the ability to annoy his father by raising his eyebrow, the account then predicts that "if I raise my eyebrow to signal disapproval at something I've seen on the news, … in doing so I've exercised my ability to annoy my father, [even] when he is *not there* to annoy" (Carter, 2021, p. 2507). We regard this as a convincing counterexample to Carter's own account. Carter responds that in the described case the ability to annoy his father is indeed exercised, but Gricean conversational maxims make it inappropriate to state this (Carter, 2021, 2507). But this response is unconvincing: even if the ability to annoy his father is conversationally relevant—e.g. because we are just talking about how he would annoy his father if he wanted to—, it does not seem appropriate to say that he has exercised this ability. It would seem much more felicitous in this case to say 'that is how he *would have* exercised the ability to annoy his father', which suggests that he didn't exercise it on this occasion. This latter fact, however, cannot be explained by Carter's proposed analysis.

Carter's case is quite unlike our case of Anna. Anna's ability to hit the target has a role to play in *explaining* how she behaves; Carter's disposition to annoy his father, whatever its link to counterfactual success, has no explanatory role to play and does not affect how he behaves. Anna exercises her ability to hit the target when her arrow is taken off course; Carter does not exercise his ability to annoy his father when his father is not present.

What we need is a middle ground which, unlike Modal Coverage, respects the explanatory link between the ability exercised and how the agent behaves, without making success necessary for exercise, as Exercise-Success does. Our proposal for such a middle ground will be given in section 6 below. But first let us introduce the main ingredient for that solution.

4 | INTRODUCING ADAPTIVITY

We believe that the shortcomings of existing accounts of ability stem from their neglect of a core feature of abilities: their adaptivity. Adaptivity and the related ideas of 'sustaining causation' and 'causal guidance' played a prominent role in the debate about deviant causal chains (see e.g. Thalberg, 1984, Mele, 2000) in the philosophy of action. In this debate, defenders of causalist accounts of (intentional) agency came to realize that causal initiation of behaviour by mental antecedents is insufficient to account for agency and that a more continuous causal influence during the course of the action was needed. While we do not consider their proposals successful insofar as they were

intended to shore up the causalist model of (intentional) agency, we believe that they pointed to a key feature of agency which previous causalist accounts had overlooked and which is crucial to understanding agentive abilities as well.[5] It is therefore no surprise that adaptivity is a feature that philosophers of action far beyond the causalist camp have drawn on, e.g. in order to explain agency (Steward, 2012)[6] or acting for reasons (Mayr, 2011).

The key idea of adaptivity is most easily explained in cases of teleological activities which consist in the pursuits of goals. What is needed in order to ascribe the pursuit of some goal to an agent? To begin with, the agent must, more or less, do what she takes to be necessary for pursuing this goal and pursue some course she takes to be conducive to her end. But starting out with a course of action the agent has initially considered to be conducive to achieving her end is not enough for pursuit of this end. The agent must also keep track of how she is getting on with this course, and continuously adapt her behaviour in light of the progress she has made or not made, in light of changes in external circumstances or in her own abilities which are relevant to how she can attain her end, or in light of new information about such factors which she previously lacked. This may manifest itself, e.g., in her trying again when she has failed at the first attempt, in her correcting or changing the way or method to reach her end, in adapting further measures to overcome new obstacles, etc. Think again about the experienced archer, who will monitor the environment in which she is shooting for sudden changes of wind and adjust her position accordingly, as well as try again with a posture adapted to her earlier margin of missing the target if her first attempt was not successful. These features constitute what is sometimes nicely called the 'plasticity' of goal-directed behaviour (Woodfield, 1976).

Adaptivity need not manifest in actual corrections to one's behaviour: what matters is that the agent *has* the relevant capacities and is ready to exercise them if and when the need arises. Furthermore, agents may be akratic in their goal-pursuit and therefore may not always adapt their behaviour, even when they know that this would be required under the circumstances. Still, if they showed no adaptation whatsoever, and we did not believe that they would show *any* adaptation if required, we would come to doubt that they were really pursuing the aim in question.

While this simple sketch has its most natural application to goal-directed behaviour, it is naturally extended to other kinds of intentional activities, at least when these involve an intention that the agent is executing. Even when an agent does something for its own sake, rather than for some further goal, the monitoring of how she is 'getting on' in realizing her intention and the consequent corrections, when required, are characteristic of such activities.

So far, we have spoken of adaptivity in the pursuit of a single goal. Such 'pursuit-internal' adaptivity includes, mainly, adaptivity to (changes in or new information about) (i) external circumstances relevant to attaining the aim, and (ii) the agent's own (non-)progress in her performance. In most cases, though, we cannot keep adaptivity to one feature apart from adaptivity to the other. Imagine that you are chasing a piece of paper which is blown around your room by a gust of wind. The question (ii) whether you are now any nearer to catching it can hardly be answered independently of the question (i) whether a new gust of wind has blown the paper still further away.

It is easy to understand why adaptivity in this 'pursuit-internal' sense is crucial to the kind of agents that human beings are. We are not omnipotent, omniscient or infallible, and we often have to act under changing circumstances. Therefore far from all of our attempts to attain an end are successful all at once. Most of them need some adaptation: not only at the outset, when we first choose the adequate means in light of the information we have then, but also continuously during our action, in light of new information about 'how we are getting on' and the external circumstances or changes in them. At the same time, since few, if any, of our actions are instantaneous, we *can* correct and adapt them, to some extent, during the course of their performance.

However, there is a much wider range of features to which we must adapt our activities. Human agents (at least beyond the age of small infants) always have *several* ends at a time, and even when they perform an action in order to reach one particular aim, there will be other aims in the background with which the pursuit of this end can interact and conflict. (The same point holds, *mutatis mutandis*, for engagement in intentional activities which are not plausibly classified as goal-pursuits, at least when the agent has an intention she is trying to realize in acting. Here, too, the agent's activity of realizing her intention can interact and conflict with the pursuit of other ends and attempts to realize other intentions. For the sake of simplicity, we will only speak of end-pursuits in the following.)

Adaptivity to one's other end-pursuits sometimes requires one to delay the pursuit of an end or to give it up altogether, if pursuing this end is fully incompatible with pursuing ends regarded as more important. More often, however, it only requires that we choose means which are compatible with the pursuit of these other ends, which do not make their pursuit too costly or endanger their success. This often implies settling for less than optimally efficient or secure means in pursuing a given end. Adaptivity to other end-pursuits therefore concerns both *how* we perform certain actions and *whether* and *when* we do so. What it entails in a given case depends on two factors: how our different ends can, in fact, be pursued, and their relative importance to us.

Like pursuit-internal adaptivity, adaptivity to other goals is crucial to human agents. Imagine an agent who was completely unable to adapt the pursuit of one particular goal to the pursuit of other goals. Such an agent would pursue the former aim no matter what the consequences of this pursuit, and of the means she took, would be for her other aims (Mayr, 2017). It is hard to imagine a person doing this consistently; even the cases we can imagine which come closest to this are cases of severe psychological disorder (monomania or OCD). Neither would a person who pursued *several* aims in a completely non-adaptive way fare much better: while not monomaniac, she would be paralysed in her agency, once the pursuit of her different aims came into conflict. Given that we would no longer be able to function as agents in both these alternative scenarios, we must be capable of adapting our pursuit of an end to our pursuits of other ends, if our agency is to be preserved over time.

There are thus two dimensions of adaptivity: one is focussed on the pursuit of one particular end we are pursuing by a given action, while the other dimension provides for flexible adaptation to (information about) conflicts between our pursuits of ends. These two dimensions are tightly linked and can therefore legitimately be regarded as dimensions of one single phenomenon. For the second dimension is, at its core, already part and parcel of the flexibility required for the pursuit of most individual ends. We rarely, if ever, pursue single goals in isolation; individual goals are almost always embedded in a structure of sub- and super-ordinated goals. For illustration, imagine that you are running a race with several rounds. When you run the first round, you do so in order to run the whole race. But to pursue this latter aim, you need not only complete this first round in some way or other; you must complete it in such a way as not to be completely exhausted and incapable of continuing afterwards. Otherwise you would have achieved your intermediate aim (running the first round), but not in a way compatible with reaching your overall aim. So you must adapt how you pursue your first intermediate aim to the pursuit of your other subordinate aims (running the other rounds) if you are to pursue your overall aim effectively. And that overall aim will in turn be a subordinate aim relative to others, such as athletic achievement or staying fit; in pursuing the aim of running the race, you will have to be adaptive to your overarching aims by not, say, risking injury that would interfere with them. Given that our actions are generally embedded in more extended hierarchies of subordinated and superordinated goals, it is to some extent arbitrary whether we think of an instance of adaptation as 'pursuit-internal', or as an adaptation to further aims.

It merits emphasis that adaptivity, understood as comprising both these dimensions, is an importantly richer notion than some notions of control which may appear similar since they also stress flexibility as an important component.[7] For instance, Shepherd (2021) spells out control in terms of successful behaviour which can be repeated under sufficiently different and changing circumstances (Shepherd, 2021, p. 15 ff.). Adaptivity, by contrast, also concerns how an agent's behaviour is embedded in her overall make-up as an agent, not just when and under what conditions it would be successful.[8]

Having introduced adaptivity, in the next two sections we will argue that it can help us better understand abilities.

5 | ADAPTIVITY AND THE METAPHYSICS OF ABILITY

In section 2, we complained that existing accounts of ability do not properly do justice to the element of control that is involved in ability; they account at best for control over *whether* an ability is exercised, but not for control over *how* we exercise our abilities. Our suggestion now is simply that the control involved in abilities is better understood in terms of adaptivity.

How can adaptivity be integrated into an account of agentive ability? A first option would be to simply add it to existing accounts by using it to specify what agentive abilities are abilities *for*. On such a view, an ability is never just an ability to φ; it is always an ability to φ *in adaptive ways*. In the context of a conditional or dispositional analysis, this would yield the view that an agent has the ability to φ just in case they would or are disposed to φ adaptively if they intended (tried, …) to φ.

Such a view, however, would only partly capture the role of adaptivity. We have seen in section 4 that adaptivity is not merely a matter of how one does something, but also of whether and when. The first, 'pursuit-internal' dimension of adaptivity is a matter of how an agent does what she does. But the second dimension concerns also whether and when the agent performs certain actions in light of her other goals and values. Given this, adaptivity can be seen as the common genus of these different aspects of control. And although the two aspects of adaptivity usually go together, they can come apart. There can be cases where a behaviour or omission is due to the adaptivity of the ability to φ in the second form, without this behaviour or omission being an instance of an adaptive φ*ing*—and vice versa. An agent may refrain from exercising her ability to φ on a particular occasion, because she is waiting for the right opportunity to φ. In such a case, the omission is an instance of her adaptivity with respect to whether to φ. However, since the agent does not φ, *a fortiori* she doesn't φ in an adaptive way. Conversely, an agent's activity may display a high degree of adaptivity in *how* to conduct this activity while lacking adaptivity as to whether or not she engages in it. E.g. an extremely compulsive birdwatcher's behaviour may display adaptivity in how but not in whether she seeks out birds (she does so even in the desert where there are no birds around).

To understand the adaptivity of ability, then, it is not enough to say that abilities are abilities to do something adaptively. Rather, we should understand abilities themselves as being adaptive, and adaptivity as the distinguishing mark of abilities themselves.

But this proposal, one may worry, will lead to a vicious circle, in the following way. In section 4, we spelled out adaptivity in terms of the agent's further capacities, e.g. those for monitoring changes in the surroundings and adjusting one's behaviour. In the relevant context of ability-ascription, it is natural to take these further capacities to be (at least in part) abilities themselves: The competent archer who has the ability to hit the target must also have the *ability* to change her

posture etc. But if this is true, it seems that, in order to understand the agent's power to hit the target as an ability, we must already ascribe to the agent further abilities. Hence we seem to have made little progress in understanding what makes a power into an ability: in order to understand what characterizes abilities, we have to presuppose that we already understand what makes these other powers abilities.

To see how the threatening circle can be avoided, we need to first fix on a background metaphysics. We will use the term 'power' to cover abilities, capacities, potentials, or dispositions. We ourselves prefer a realist metaphysics of powers, but what we say in the following should be translatable into a reductive metaphysics. We take powers to be individuated at least in part by their manifestation; depending on the view we take, a reductive metaphysics of powers can proceed either via counterfactual conditionals or by existential quantification over possible situations (Vetter, 2014). Our claim is that among the powers of an agent, her *abilities* are distinguished from others by their adaptivity. But how exactly is this meant to work?

We suggest the following two-stage understanding of attributing an ability to φ to an agent. First, we attribute to the agent a range of powers that specifically concern forms of behaviour required for or conducive to φing under different circumstances: the power to φ, powers to φ in specific ways and to φ in specific circumstances, powers to perform component actions of φing, etc. Adaptivity, however, not merely requires possession of a large enough set of such behavioural powers. The manifestation of these 'first-order' powers must also be suitably 'organized' and integrated, if the agent is to adapt flexibly to changes or new information. For this integration, we must also, second, attribute to the agent a range of adaptivity-related 'higher-order' or meta-powers: powers to monitor one's progress, to inhibit impulses, to compare the relative importance of one's goals, to reconsider, to interrupt ongoing activities, and so on. These 'meta-powers' do not themselves directly extend the range of outward behaviour of which the agent is capable, but affect the ways and circumstances in which manifestation of the 'first-order' powers are organized. Some of these meta-powers may be involved in many or even all abilities, such that their possession is a requirement on an agent's having any abilities at all. Importantly, the agent must not only have these 'meta-powers', but they must have application to the first-order powers that directly concern φing. It is not enough for the agent to have a power to shoot an arrow and a power to monitor her behaviour; the exercise of the former power must be capable of being influenced by the results of the manifestations of the latter power. Otherwise, the agent would only be capable of registering how things go, but could not respond to such information in the way required for adaptivity.

Crucially, the powers attributed so far to the agent are not yet classified as abilities; we can think of them as reducible dispositions (Vihvelin, 2013), or as irreducibly modal properties (Vetter, 2015), or what have you. What is required for the agent to count as having the ability is possession of the whole bundle (or a large enough sub-set) in a properly integrated fashion.

We can now further ask what an ability *is*. Here we have two options. A 'bundle view' simply identifies the ability itself with the entire bundle of powers. Alternatively, a structuralist 'network' view would classify the individual powers within the bundle as abilities in virtue of their being members of such a bundle. This latter solution, inspired by the holistic spirit of structuralist views in other areas (e.g., Bird, 2007), would make the question of whether a given power counts as an ability extraneous to that power itself: it is a matter of the network of other powers within which it is situated. Either way, circularity is averted because we explain the adaptivity of abilities in terms of the agent's powers without already classifying those powers as abilities.

We thus propose the following account of ability possession:

> **Adaptive Ability** An agent has the ability to φ just in case she possesses a sufficiently extensive and integrated set of first-order and meta-powers to constitute a powers bundle required for adaptivity in φing and for adaptivity in whether and when to φ.

We do not claim to have provided the metaphysics of adaptive abilities once and for all. For one thing, **Adaptive Ability** leaves it open how possession of the relevant sets of powers can be implemented and which more specific processes underlie their exercises.[9] For another, we have left it open how **Adaptive Ability** relates to extant accounts of abilities. In fact, we can view it as either competing with or complementing conditional views.

As *competitor*, our proposal replaces the appeal to conditionals, dispositions or what have you with adaptivity. We have seen, after all, that adaptivity incorporates not merely the kind of control that we found lacking in conditional accounts—control regarding *how* abilities are exercised—but also the kind of control that conditional accounts, too, capture—control with regard to *whether* the ability is exercised. Moreover, a purely adaptivity-based account has the potential to explain some of the appeal of its competitor. An agent's adaptivity with respect to *how* they φ will typically explain the fact that if the agent were to try to φ, she would φ successfully. For if the agent were to try to φ, she would go about it in an adaptive way, if she has the ability, and thus in a way which tends to lead to success.[10]

As *complement*, our account can be incorporated with a conditional-style account like Vihvelin's, helping specify which conditionals must be true, or which dispositions must be possessed, for an agent to count as having an ability, and thus resolving our worry from section 2 that not any bundle qualifies as an ability.

Whichever way we go with **Adaptive Ability**, we submit that it provides a plausible and fruitful framework for better understanding the control involved in ability. In addition, as we will now show, it helps us better understand the conditions under which an ability is exercised.

6 | ADAPTIVITY AND THE EXERCISE OF ABILITY

In section 3, we argued that we need an account of ability exercise that makes successful φing neither necessary nor sufficient for an exercise of the ability to φ and does not classify as exercises spurious cases with no explanatory connection between ability and exercise. The account that we have developed of adaptivity enables us to formulate such an account.

On the view sketched in section 5, having an ability to φ is a matter of having a number of interrelated powers, which either constitute, as a bundle, the ability to φ, or bestow upon the power to φ the status of an ability. Correspondingly, we can think of ability exercise as being a matter of exercising not a single power (to φ) but several powers in the relevant bundle. Thus we propose as a first approximation:

> **Adaptive Exercise** An agent exercises her ability to φ just in case she exercises enough of the powers that constitute her adaptive ability to φ.

Adaptive Exercise needs some unpacking.

First, in speaking of '*her* ability to φ', the proposed account presupposes that the agent possesses this ability, i.e., it presupposes that she already fulfils the condition of **Adaptive Ability**. An agent can only exercise an ability if she has it. This already takes care of Bela, the lucky novice: since

he does not possess the relevant ability, his hitting the target cannot count as an exercise of this ability.

Second, the 'powers that constitute the ability to φ' are just those that figure in the right hand side of the conditional in **Adaptive Ability** in section 5. Exactly what 'constitute' means here depends on the metaphysical picture of abilities that is adopted. (E.g. on the 'bundle view' of ability, the relevant powers are those that are part of the bundle.) In any case, we can see again why Bela does not count as exercising an ability to hit the target: while he may be exercising one power (to hit the target), he does not exercise other relevant powers. By contrast, Anna, our accomplished but unlucky archer, does exercise a great deal of the powers that constitute her ability to hit the target: the ability to adjust her posture in the right way, nock her arrow in just the right way, apply the right force, and so on. **Adaptive Exercise** also helps us to correctly classify Carter's example. In raising his eyebrows, Carter is exercising the power to raise his eyebrows, a power which does contribute to his ability to annoy his father. But he is not exercising any of the powers that would make his behaviour *adaptive* with respect to annoying his father, such as the powers to monitor his father's mood and adjust his behaviour if his father turns out not to be annoyed by what he is doing.

Note, incidentally, that **Adaptive Exercise** can uphold a principle like Exercise-Success for the component powers, as long as those are not themselves abilities, while rejecting it for abilities themselves. We take this to be an advantage.

Third, **Adaptive Exercise** contains the vague and gradable expression: 'enough of' the powers need to be exercised. How much is enough? We submit that there is no sharp boundary, just as there is none between possession and lack of ability. If Bela continues to practice shooting arrows, he will acquire the ability eventually, but there is no one threshold such that once Bela crosses it, it is definitely true that he has the ability, while just below the threshold he definitely lacks it. And what is true of ability possession is true of ability exercise, too: when Bela is situated in the 'grey area' between novicehood and full-blown ability, and exercises all the powers that he has already acquired regarding arrow-shooting (insofar as they fit the situation), does he exercise the ability? We think the answer is 'to some extent'. When Anna, who has all the powers required for full-blown exercise, does a sloppy shot which manifests some of her ability-constituting powers that are deeply ingrained but neglects a great deal of those that would require more attention, does she exercise her ability? Again, we think the answer is 'to some extent'. The pull to respond in the affirmative is certainly stronger when the agents do hit the target, which goes to show that the power to φ, unsurprisingly, occupies a special place. But as we have argued above, no single power's manifestation—not even the power's to φ—suffices on its own for the exercise of an ability to φ.

Fourth, **Adaptive Exercise** talks about the agent *exercising* enough of the ability-constituting powers. It may seem that we should also appeal to non-exercised powers, powers that *would have* been exercised if necessary: Anna *would have* adjusted her posture if the target had moved, while Bela would not have done so, for instance. It is true that such non-exercised powers play a role, too, especially when it comes to the first-order powers to behave in different ways which are included in the adaptivity bundle. Still, we do not think that mere possession of the powers in this bundle is enough for ability exercise—otherwise possession and exercise of an ability could not be properly distinguished from each other. Consider Charlie, who is a professional archer and has all the powers needed for having the ability to hit the target. But he is just goofing around with his gear. He puts the arrow to the bow and performs random movements. Yet by sheer coincidence his arrow hits the target. Charlie has not exercised his ability, and it is cases such as his which are excluded by the requirement that enough of the relevant powers be *exercised*, not just possessed.

Note, moreover, that at least some relevant meta-powers, such as the power to monitor changes in one's environment, will arguably always be exercised in adaptive behaviour even when the agent does not make actual modifications to her behaviour.

While **Adaptive Exercise** as it stands is most likely not the last word to be said on ability exercise, we submit that it constitutes progress: it avoids the problems of Exercise-Success without being as undifferentiating as Modal Coverage. It helps to further exhibit the explanatory power of thinking about abilities in terms of adaptivity.[11]

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ENDNOTES

[1] For discussion of some of these issues see, e.g., Fridland 2013; Shepherd, 2021, Ch. 7.

[2] For some alternatives that we will not discuss here, see Brown (1988), Horty and Belnap (1995), Fusco (2021), and Maier (2013; 2022).

[3] Accounts which understand our agentive abilities as 'two-way' powers, i.e. as powers that can be exercised or not at the agent's will (e.g. Alvarez, 2013; Steward, 2020), also typically focus on the agent's control over *whether* these powers are exercised. Steward (2012) herself suggests a more nuanced reading, which is closer to our own later proposal, but without using it to formulate a theory of ability.

[4] Frankfurt (1978) is usually credited with first stressing the importance of 'guidance', rather than causal origination for the issue of agency.

[5] Since we cannot offer any sustained critique of the causalist model here, one may wonder whether our subsequent account of agential abilities would at least be compatible with causalist accounts relying on sustaining causation. According to such accounts, *every* (intentional) action involves some kind of adaptivity. Combined with our account, this may seem to yield the conclusion that every (intentional) action of φing involves the exercise of an ability to φ. But if there are lucky yet intentional successes, then this conclusion is false. In response, note first that even if every (intentional) action involves ability exercise, it does not follow that every intentional φing involves exercise of the *ability to* φ. Second, control comes in degrees. If all actions involve some measure of control and control can be explained in terms of adaptivity, all actions must display *some* measure of adaptivity. However, the degree of control, and the degree of adaptivity, required for exercising an ability may well be higher than the degree of control required for (intentional) agency. Thus even if our account of ability were combined with the causalist accounts mentioned, it would not follow that all actions of φing necessarily involve exercises of the ability to φ.

[6] Note, however, that for Steward, flexible adaptation is only an *indication* of the genuinely undetermined 'sourcehood' which is truly essential to agency, see Steward (2012, p. 112).

[7] Douskos (2019) regards, as we do, monitoring and flexible adjustment of behaviour as necessary for (bodily) ability exercise (2019, pp. 4319 and 4322) (without, however, giving it the central theoretical role we attribute to it). But his account solely focuses on the first (pursuit-internal) dimension of adaptivity.

[8] However, adaptivity as explained here is still much less encompassing than (though presumably included in) the range of behavioural patterns Ryle describes as characteristic for intelligent capacities in 1949, ch. 2. Neo-Rylean accounts of know-how also use much richer notions, e.g. Löwenstein's notion of 'responsible control' (Löwenstein, 2017). An important difference between the latter account and ours is that we do not think that 'mere' (at least agential) abilities—as distinct from know-how—only involve reliable success: instead, their reliability rests on their adaptivity.

[9] The question of which more specific powers and mechanisms underlie the required meta-powers and first-order powers is one we want to explicitly leave open in this paper. (And the question of the precise mechanisms will, in part, be an empirical one.) Fridland (2014, pp. 2744 ff.), who emphasises, as we do, the connection between control in skilled behaviour and the feature we have called 'adaptivity' (though with an emphasis on fine-tuned adjustment), offers an empirically informed tripartite list of the forms of control required for skilled action. While these forms are primarily related to the first dimension of adaptivity as described above, we would regard this as one, at least partial, possible implementation.

[10] The account can further explain the appeal of two-way accounts of ability (see fn. 3), in terms of the second dimension of adaptivity: adaptivity to other goals and values will typically enable an agent to refrain from doing something in the right kinds of circumstances.

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