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Really situated self-control: self-control as a set of situated skills

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Abstract
Traditionally, self-control is conceptualized in terms of internal processes such as willpower or motivational mechanisms. These processes supposedly explain how agents manage to exercise self-control or, in other words, how they act on the basis of their best judgment in the face of conflicting motivation. Against the mainstream view that self-control is a mechanism or set of mechanisms realized in the brain, several authors have recently argued for the inclusion of situated factors in our understanding of self-control. In this paper, we review such recent attempts from the perspective of situated accounts of cognition and argue that even though these accounts integrate situational features, they ultimately still rely on an orthodox, neurocentric view of self-control. Instead, we will argue that in order to develop a really situated account it is necessary to radically rethink what self-control is. Building on recent work on extended skill, we will develop an outline of a really situated account of self-control.

Keywords Self-control · Skill · Situated cognition · Willpower

1 Introduction

The road to achieving our goals is paved with all kinds of impediments, many of which originate in our own impulses and desires: we would not achieve much if we were to succumb to such impulses and desires all the time. It is therefore no surprise that self-control, or the ability to act on one's best judgment in the face of conflicting motivations, is a topic of great interest for anyone wanting to understand agency.

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Traditionally, self-control is explained in terms of specific cognitive mechanisms that are taken to be somehow realized by brain processes[1]. For example, several authors working in the Humean tradition presuppose the existence of motivational mechanisms that can shift the balance of the agent's desires, in support of the most valued one (Kennett & Smith, 1996; Mele, 1987; Mischel et al., 1989). Others focus on the notion of willpower as the crucial resource with which we suppress temptations and impulses (Ainslie, 2021; Baumeister et al., 2007; Henden, 2008; Holton, 2003). Even accounts that argue for a broadening of the concept of self-control, for example by pointing at the role of non-effortful strategies (Fujita, 2011; Gillebaart & Ridder, 2015) or skills (Bermúdez, 2021; Fujita et al., 2020; Mylopoulos & Pacherie, 2017; Sripada, 2021) hold on to the basic assumption that the concept of self-control refers to cognitive mechanisms or traits that are realized in the brain. For example, Sripada (2021) explicitly aims to ground his "unified, mechanistically precise account of self-control" in neuroscientific research on cognitive control (p. 801).

However, in recent years, situated trends in our thinking about the mind have reached the debates on self-control, and researchers have started taking into account the role that factors beyond our brains, i.e., our bodies and the situation in which we are placed, play in its exercise (Balcetis & Cole, 2009; Hung & Labroo, 2011; Duckworth et al., 2016; Yahya, 2021). Think of someone who wants to quit smoking. Such a person can employ different strategies to fight the temptation, including repeatedly telling themselves that smoking is bad for their health, or trying to exercise 'pure willpower' while staring at the cigarettes in front of them. However, these may often not be the most effective strategies for achieving self-control. Instead, the person can opt for changing the situation so that the strength of the temptation is mitigated (see Duckworth et al., 2016). These kinds of strategies are very familiar to us: this is what we do when we go somewhere else and leave our cigarettes behind, or when we clear and organize our desk to avoid distractions while finishing our boring paperwork.

In this paper we will contend that even though these accounts have made an important contribution to the debate, they do not go far enough: although they recognize the importance of situated factors for achieving self-control in some circumstances, they hold on to the orthodox view that self-control must be explained in terms of a set of cognitive, neurally realized mechanisms that are primarily responsible for it. Instead, we will argue, a genuinely situated approach to self-control requires a radical shift in our understanding of what self-control is. This will lead us to claim that self-control should be understood as a set of situated skills. We will argue that agents are skilled in self-control in so far as they are able to deploy effective strategies in various contexts, as the suitability of different strategies depends on the specifics of each self-control situation.[2]

In the next section we provide a general outline of situated approaches to cognition, which form the theoretical background against which situated approaches to

[1] Such mechanisms are described with various terms, and sometimes interchangeably, as for example 'internal', 'intrapsychic' or 'intracranial' mechanisms. (Bermúdez et al., 2023; Duckworth et al., 2016; Sripada, 2021)

[2] As Gilbert Ryle stated in *The concept of mind*: "The performances in which strength of will is exerted may be performances of almost any sort, intellectual or manual, imaginative or administrative" (1949, p.60).

self-control are being developed. Subsequently, in Sect. 3, we will take a closer look at recent contributions to the self-control debate which emphasize the importance of situational factors. We will argue that even if they take important steps in a situated direction, these accounts are not yet genuinely situated. As a final step, in Sects. 4 and 5, we will outline requirements for a really situated account of self-control and discuss some implications for empirical research.

2 A primer on situated cognition

In the cognitive sciences, "situated cognition" is used as an umbrella term that designates a series of research programs grounded in extended, embodied, embedded, enactive, and ecological theories of cognition, often combining ideas and principles from more than one of these approaches (Gallagher & Varga, 2020; Robbins & Aydede, 2009; Rowlands, 2010). Even though the five '*E*s' just listed do not entail one another and even though there are differences between the various situated accounts, it is possible to find some overlaps and points in common. In our view, there are two main ideas that all situated approaches endorse:

1. The view of cognition as primarily[3] active, something the organism *does* (instead of something that merely *happens to it*) in order to adapt to its environment and achieve particular goals.[4]
2. The view that, in order to explain cognition, we should focus on how the organism as a whole (including its body and brain) interacts with its environmental context. Such holistic explanations cannot be reduced to explanations in terms of brain processes.

In other words, the various approaches to cognition that fall under the "situated" banner are unified by the assumption that naturally occurring cognitive phenomena emerge from the active interaction between the agent as a whole and its environment, including its socio-cultural context. In the remainder of the paper, we will refer to this as the "Situated Cognition Thesis."

Our main argument in the paper will be that *if* one aims to develop an understanding of self-control based on this thesis, one should take a more radical path than the ones chosen by most contributors to the situated trend in self-control research. This means that we do not aim to provide a defense the Situated Cognition Thesis in this

[3] The qualification 'primarily' is added because the approach leaves room for certain cognitive phenomena to be non-active (for example certain forms of memory).

[4] Vierkant (2014, 2022) provides extensive arguments for the intimate connection between intentional action and situated cognition. Briefly, he argues that if we accept that intentional action is a constitutive part of cognitive processes (think of directing your attention, or rehearsing arguments), and we recognize that we cannot draw a clear boundary between internal (brain-bounded) and environment-involving intentional actions (e.g., using a notebook to perform calculations), then we have to accept that extended cognition is true, i.e., that cognition arises from the interaction of brain, body and environment. Furthermore, Vierkant argues that so-called 'internal' self-control actions ultimately cannot be clearly differentiated from environment-involving self-control actions ('tying-to-the-mast-strategies'), which closely aligns with our main point.

paper. However, in order to show why it might at least be seen as worthwhile to develop a situated account, we will give a brief overview of the main arguments for the general thesis.

The situated trend in the cognitive sciences is motivated by three main (and interconnected) arguments. The first one is empirical in nature, and it has to do with the discovery of cognitive processes that exhibit so-called "Nontrivial Causal Spread", that is, processes that are the result of distributed mechanisms. The second argument states that situated explanations are often to be preferred over intra-cranial explanations, because they are frequently explanatorily more parsimonious. Finally, the third argument is framed in terms of evolutionary plausibility. We will review the three arguments in turn.

As outlined by Wheeler, "Nontrivial Causal Spread", or NtCS, obtains whenever a given phenomenon, in this case a cognitive behaviour, is the product "not exclusively of, say, mechanisms located in the agent's brain, but rather of massively distributed mechanisms that extend across brain, body, and environment" (2005, p. 200). Several real-life examples of complex cognitive activities display NtCS. One of them is the well-known example of phonotaxis – spatial navigation and sound-seeking behaviour – in female crickets (see Webb, 1995; see also Barrett, 2015). Other examples of NtCS concern the everyday practices of memorizing and recalling important information by using artifacts or interacting with other agents. For instance, Sutton et al. (2010) refer to an example in which an old couple purposively collaborate in a conversation to recall the name of a show they attended during their honeymoon, 40 years ago. As they explain, "[a]lthough neither individual could immediately recall the name of the show, through interactive cross-cueing the couple jointly access the information […] [the name of the show] was not accessible until they engaged in this process of collaborative facilitation" (p. 522).

The second argument in favour of situated cognition concerns explanatory parsimony, and it appeals to the kind of cognitive resources we assume to be needed to solve particular problems (see Chemero 2009, pp. 72–73, 77). Neurocentric explanations often require positing complex models and computations as means to solve cognitive tasks. This contrasts with situated explanations, in which a large part of the cognitive task is achieved by implementing skilful agent-environment interactions. The classical studies of Kirsh and Maglio (1994) on different ways of playing Tetris, support this view. Tetris players who are allowed to manipulate the zoids make quicker and more accurate decisions than players who are forced to use mental rotation (p. 1). In short, this second argument states that if a certain cognitive achievement can be fully explained in terms of skilled, well-coordinated actions upon the environment, there is no reason to prefer an explanation that has to presuppose the existence of intricate cognitive mechanisms, models and computational processes.[5]

The argument from explanatory simplicity is directly linked to the third argument: the argument from biological plausibility. Clark summarizes the argument as follows:

[5] It is worth noting that situated explanations are not necessarily anti-representational. In fact, whereas some theories in situated cognition (e.g., ecological psychology, enactivism) rejects representations, others do not (see, e.g., Clark, 2008; Wheeler, 2005). Nonetheless, the assumption is that acknowledging the role of bodily and environmental processes makes it possible that the kind of processes posited to explain cognition are much less sophisticated and demanding (Clark, 2008, p. 165).

"what goes for physiology applies equally well to cognition: we should not expect evolved organisms to store or process information in costly ways when they can use the structure of the environment, and their ability to act in it, to bear some of that cognitive load" (Clark, 2001, p. 413). According to this view, there is no reason to assume that individuals achieve cognitive goals by having developed costly (metabolically speaking) cognitive-neural processes if they have access to much cheaper situated strategies.

To sum up, in the debate about the nature of cognition, brain-focused explanations are being contrasted with explanations where the whole agent actively interacts with the environment to create the necessary conditions to achieve particular goals. The notion of 'active' is taken very broadly here, as organisms can display activity ranging from very minimal goal-directedness to full-fledged intentional action done for reasons. We fully endorse this broad understanding of activity. However, in this paper we will be concerned with self-control, which requires quite particular and complex forms of cognition. Exercising self-control requires agents to relate to the conflicting motivations they experience, and to act on some of these motivations while disregarding others. Therefore, our analysis will focus on specific kinds of cognitive activity that agents employ in the context of self-control, and that can be understood as *intentional* activity (Anscombe, 1957; Kalis, 2017)[6].

Of course, much remains to be said about the Situated Cognition Thesis, and we do not want to argue here that this is the best framework to think about cognition. Our main aim has been to present a general picture of the thesis as it has recently become a topic of discussion in the study of self-control. In the following section, we will take a closer look at two recently developed situated explanations of self-control.

3 Recent attempts at situating self-control

Although as said, explanations of self-control traditionally focus on cognitive mechanisms realized by brain processes, the situated trend has made its way into the self-control debate.

For instance, Hung and Labroo (2011) focus on the role bodily factors play in bringing about self-control. They study how firming one's muscles (e.g., clenching fists or tightening calves) enables participants to perform better in self-control related tasks, such as keeping their hand inside a bucket of ice, enduring physical pain, drinking a vinegar-based liquid, or choosing healthy food during snack time. According to them, this shows that "the body too might be influencing the mind to a greater degree than has previously been recognized" (p. 1046), and that "the body can influence self-control by engaging the mind" (p. 1059). Their proposal is thus that the body can influence self-control by "engaging" and "influencing" cognitive-neural processes (aka "the mind") that subsequently implement self-control. As the authors suggest: "the process by which the body influences the mind is more likely to be one in which muscle firming automatically activates mental resolve and facilitates automatic self-control." (p. 1060). So even though Hung & Labroo broaden the explanatory picture

[6] We do not claim that *all* cognitive activities can be understood as intentional activity.

by addressing bodily factors, nevertheless, their explanation ultimately reduces to an explanation in terms of neural processes: it is those processes that ultimately do the real work in executing self-control (see Balcetis & Cole, 2009 for a similar position). Moreover, their situated approach seems to come at the cost of suggesting a problematic form of mind-body dualism.

An account taking a step further is developed by Yahya (2021). Yahya advances the thesis that "[t]he brain and situated factors both cause self-control" (p. 1), and thus that situated factors are just as important for understanding self-control as the brain (p. 5). The crux of her argument is that self-control is situated in the sense that factors external to the agent have a direct (i.e., non-mediated) causal impact on self-control "in virtue of being inherently tied to strengthening or summoning willpower" (p. 8). Her account thus works with the assumption that ultimately, the 'real work' concerning self-control is done by willpower, raising the question how willpower should be understood. This does not become clear in the paper (and critics have argued that the term itself actually constitutes a "catch-all phrase" that denotes different phenomena (Gross & Duckworth, 2021; Kalis, 2017; Khalil, 2021). However, many authors that use the notion take willpower to consist "solely in intra-cranial psychological processes" (Bermúdez et al., 2023, p. 34; for similar claims see: Ainslie, 2021; Baumeister et al., 2007). Therefore, like Hung & Labroo's, the account developed by Yahya does not distance itself from the orthodox assumption that even if external factors might play a causal role, the "real" self-control ultimately happens in cognitive mechanisms that are realized in the brain.

A reader could object that we are being too harsh, and that there is no reason to suppose that a situated cognitive explanation could not give explanatory priority to certain cognitive-neural mechanisms while maintaining that bodily processes and environmental factors are causally relevant for cognition. We argue that this reply runs the risk of trivializing the Situated Cognition Thesis. To see this, it is important to note that even those who think that cognition occurs exclusively in the brain agree that neural structures have evolved to function in conjunction with specific factors that are external to the nervous system and even the organism itself. A case in point is Aizawa, a strong supporter of orthodox cognitive science, for whom the view that cognitive processes are causally affected by factors outside the brain is something that "[e]ssentially everyone in cognitive science accepts" (Aizawa, 2015, p. 757). For defenders of such a view, the extra-neural elements "provide the sort of bodily context in which these cognitive processes are situated […]. But this does not mean that there is no distinction between cognition and its bodily context" (Rowlands, 2010, p. 55). We do not share the underlying assumption here that only what happens "in the brain" or "in the head" is cognitive, while everything that happens outside of the skull is not. Instead, we hold the conditional claim that *if* one understands what the brain is doing as cognitive activity, then it follows that one needs to take the whole brain-body-environment system into account (for a similar claim see Vierkant, 2022). Our position should thus be understood as a conceptual and methodological commitment to explanatory holism for cognition, a commitment motivated by the three arguments for situated cognition that we have discussed in Sect. 2. Such a commitment leaves ample room for the idea that in specific cases, the brain could play a

larger (or smaller) explanatory role than the body and the environment with respect to the question how self-control is realized in that case.

The proposals developed by Hung & Labroo and Yahya both fail to express the second principle of the Situated Cognition Thesis, or the commitment to explanatory holism. Moreover, we hold that these accounts of self-control do not meet the first principle of the Situated Cognition Thesis either. This principle tells us that cognition is an activity, something the organism does (instead of something that it undergoes) to achieve a particular goal. Applied to our discussion, this implies that we must consider self-control as something we do, and not as something that is the mere addition of several causal factors impinging upon us. In a situated picture, it is the individual, by her own actions, who recruits situated factors, exploiting their resources to achieve self-control. In the next section we will argue that views that locate self-control in cognitive mechanisms that unfold in the brain, by definition cannot account for self-control as something human beings actively *do*.

By contrast, Duckworth et al. (2016) do attempt to highlight the active character of self-control. In their paper, they describe a series of "situational strategies" that agents can perform precisely because of their contribution to self-control. This idea is embedded into a larger account according to which agents can control themselves by intervening in the process of impulse generation. Said intervention can occur at different phases, with the assumption that interventions that take place earlier in the process (while the impulse is still "nascent") will be more effective than those that occur later.

The "process-model" of self-control put forward by Duckworth et al. organizes self-control strategies into two groups: situational and intrapsychic strategies. The situational strategies, which include modifying and selecting our circumstances, occur "at the early stage of impulse generation" (p. 40), and are differentiated from the intrapsychic strategies, which include shifting our attention to something less tempting, reconceptualizing or re-imagining the temptation as something not so desirable, or simply modulating our behavioural response in light of the temptation. According to the authors, because the three intrapsychic strategies occur later in the impulse generation process, agents who only implement these are more prone to failure in exercising self-control. Consequently, they recommend opting for situational strategies instead.

The proposal of Duckworth and colleagues can be considered a genuine advance toward a situated account of self-control. The suggested situational strategies all involve agents actively interacting with the environment to modulate the conditions of the self-control task. However, they still hold that it is the intrapsychic cognitive-neural mechanisms or processes that are ultimately responsible for the realization of self-control. In fact, they even state that:

Considering the underlying mechanisms by which situational strategies operate leads to the insight that they are, in fact, indirectly intrapsychic. That is, circumstances outside the mind are the direct target of situational strategies, but it is the downstream effect these changes have on our attention, cognitive appraisals and response tendencies that in turn mediate the benefits of situational strategies for self-control. (p. 42)

Thus, similarly to the proposals developed by Yahya and Hung & Labroo, the assumption here is that situational strategies work because they somehow affect the

"intrapsychic" mechanisms that are *truly* responsible for self-control. The bodily and environmental factors are taken into account only insofar as they influence the relevant cognitive processes as they are realized in the brain. It is important to note that the term "intrapsychic" (which is also used (although not defined) by several authors in the debate (see for example Bermúdez et al., 2023; Sripada, 2021) is in itself quite problematic, again suggesting a distinction between things that take place "in the mind" (where the mind is apparently realized in the brain, given that "intrapsychic" is sometimes used interchangeably with "intra-cranial" (see Bermúdez et al., 2023, p.34) and things that take place outside of the 'mind-brain'.

To conclude, despite the efforts being made to advance a situated cognitive science of self-control, authors are reluctant to shake off certain assumptions that have dominated orthodox theories of cognition. In our view, this brings with it the risk of trivializing the Situated Cognition Thesis and of overlooking the key implications it may have for the research on self-control. Therefore, we claim that in order to show how a situated account of self-control could be a genuine alternative to the orthodox view, it is necessary to radically rethink our understanding of self-control. In the following sections, we will develop the outline of a really situated account of self-control by building on the two core features of the Situated Cognition Thesis described at the beginning of the paper.

4 Really situated self-control

Our proposal consists of several interrelated claims. As a start, we will argue that taking seriously the first principle of the Situated Cognition Thesis (that cognition is primarily active), implies that self-control is a person-level concept which refers to an ability of an individual. As a next step, we will argue that this provides grounds for defending a skill account of self-control. And thirdly, we will argue that the second principle of the Situated Cognition Thesis (explanation should focus on the interaction of the organism with its environment) implies that whether or not a certain activity is an exercise of self-control skill, depends on the context. This leads us to a situated understanding of the skills involved in self-control: skilful performance should be explained in terms of dynamical relations between individual and environment, which are adaptive to the specific self-control problem at hand.

4.1 Self-control as a person-level concept

The first part of our proposal is to apply the idea that cognition is active, thus something an organism does and not just something that happens inside an organism, to the question what self-control is. We believe this idea implies that self-control should not be reduced to a mechanism or set of mechanisms, whereby a mechanism is defined as an assembly of components which performs a certain function in virtue of its component parts, component operations, and their organization (Bechtel & Abrahamsen, 2005).

Whereas mechanistic explanations are immensely fruitful for understanding many aspects of human behaviour, the focus of these explanations on underlying com-

ponents and their interactions makes them inherently unsuitable for explaining the active aspect of cognition, which requires an account in terms of person-level features (Kalis, 2017). Building on the same insight, Glock (2020) has recently suggested that the framework of situated cognition could benefit from insights from what he calls the 'capacity approach to the mind' (found in both neo-Aristotelianism and Wittgensteinian thought), according to which "to have a mind is to have a range of cognitive, volitional, and affective capacities or abilities" (p. 3). Such capacities are person-level features which must not, Glock argues, be confused with their exercise, the conditions under which they can manifest, their possessor, or their vehicle (that is the physical structure that sustains the capacity).

This positions us in the family of what Sripada (2020) calls "results" views of self-control, i.e., those that define self-control as the exercise of an ability (namely, of the ability to overcome contrary motivation, brought about in whatever way), and not in terms of specific processes that are involved in bringing about such an outcome.[7] Our claim is that *if* one commits, as we do, to the first principle of the Situated Cognition Thesis, *then* self-control has to be defined in terms of an achievement brought about by an individual, and not as a process taking place inside an individual.

4.2 Self-control as skill

As a second step, we argue that taking the notion of self-control as an ability seriously suggests that we should understand the exercise of self-control in terms of skilled performance. An agent is skilled in self-control in so far as she manages to act based on her best judgments in the face of conflicting motivations, where this requires the deployment of various strategies, depending on individual and situational features. Self-control should thus not be understood as one specific skill of resisting temptation, but as a set of skills that the agent can flexibly deploy depending on the context and the characteristics of the self-control problem at hand.

This idea is shared by several approaches (and it is thus not specifically tied to the perspective of situated cognition, even if in the next step we will defend a situated account of skilled performance). Most notably, Bermúdez (2021) has proposed to understand exertions of self-control as we understand skilful actions in general, that is, as the flexible deployment of strategies. As Bermúdez points out, this rules out mechanistic explanation of skilful action[8]: "If decision-making occurs largely at the subpersonal level (the level of neural sub-systems independent of the agent's experience), this raises the concern that, by appealing to these processes to account for agency, we lose sight of what we wanted to explain" (p. 6). Bermúdez refers to this as the guidance problem, or the question how one can understand an agent's commitment or decision in terms of more fine-grained cognitive control processes. His own

[7] Sripada himself defends a process view, as he holds that results views cannot correctly distinguish cases where we think self-control is exercised from cases where we think it is not (Sripada, 2021). A traditional defender of the result view is Mele (1987), who follows the Aristotelean tradition of understanding self-control as the successful exercise of an ability. However, Mele's account is internalist too, as he defends that the different ways in which agents exercise their self-control ability are each realized by internal mechanisms. In this sense his view is quite far removed from the results view we propose here.

[8] One example of such a mechanistic account of self-control skill is developed by Sripada (2021).

proposal is to understand the skill of self-control as agents using flexible practical reasoning in order to determine what kind of control strategy is required in a specific situation. Thus, Bermúdez's framework relies on a hierarchical model of agential control which covers both personal-level processes (such as practical reasoning), and subpersonal-level processes (such as sensorimotor implementation), and aims to explain how these processes interrelate. His proposal bears some similarities to that of Mylopoulos & Pacherie (2017), who defend the idea that self-control is a hybrid skill, "constituted both by strategic intentions and the application of propositional rules or knowledge, and fine-tuned, automatized sensorimotor routines." (2020, p. 91).

As said, the idea that self-control is skilled performance is not inherently tied to the perspective of situated cognition. In fact, Bermúdez seems to understand skilful actions and self-control as the internal manipulation of different kinds of mental representations, ranging from very abstract general intentions to concrete representations in various formats (sensory, imagistic, perceptual, propositional, and so on) that are used to select the appropriate proximal control strategies (2021, pp. 9–11). In order to solve the 'interface problem' (Fridland, 2017), or the difficulty of explaining how representations that vary in format can interact with each other, Bermúdez introduces the notion of 'flexible practical reasoning', which is "the cognitive process of attentively seeking a congruent answer to the implementation question" (p. 11), i.e., the question of how to enact one's high-level intention in these specific circumstances.

Whereas we are sympathetic to many elements of Bermúdez's account (such as his emphasis on the active nature of self-control, and the need for a person-level account), the role he ascribes to subpersonal processes in implementing self-control does not fit well with the second principle of the Situated Cognition Thesis. After all, this principle emphasizes the need to reject the assumption that we can explain cognition by referring only to what happens 'inside the head', and instead commits to taking into account the brain-body-environment system as a *whole*. Here it is important to acknowledge that Bermúdez does not explicitly state that the mental processes mentioned in his model should be understood as cognitive mechanisms realized by brain states. Nevertheless, given the neuroscientific literature he refers to as providing support for his account, and the fact that he analyzes the mental states involved as representational states, the perspective on cognition as mechanisms realized by the brain seems the most obvious background story for his approach.

Given that our aim for this paper is to develop a situated approach to self-control as skilled performance, the third step we need to take is thus to develop a skill account which takes the whole brain-body-environment system into account in explaining how agents manage to act in accordance with their best judgments. To develop this idea, it is necessary first to take a step back from the topic of self-control and show what a situated account of skilled performance would look like in general.

4.3 A situated account of skilled performance

For this we will build on a proposal by Baggs, Raja and Anderson (2020), who recently developed a situated understanding of what it means to learn a skill. As they argue, in one use of the term skill, "the word is used as if it denotes some property of

the animal's body. The body is said to 'possess' a set of skills or to be constituted as a network of such skills" (p. 1). This is how authors such as Bermúdez and Mylopoulos and Pacherie talk about the skill of self-control: it can ultimately be spelled out in terms of specific cognitive processes that take place in the agent's head. However, Baggs et al. (2020) defend an alternative way in which we use the term: as referring to the performance of some activity:

When 'skill' is invoked in this second sense, it seems that the concept can no longer be understood as referring narrowly to some property of the body, but must be understood as an extended phenomenon spanning the animal–environment system. (p. 2)

In fact, they even argue that the concept of skill itself should be understood as an emergent property of the system: "the ability of any individual to achieve some desired outcome will be dependent on the skilful functioning of the system as a whole" (p. 7). Even though we are not convinced that the concept of skill could be easily ascribed to an animal-environment system (skilfulness as a feature seems to apply only to agents as they perform certain goal-directed behaviours), we nonetheless endorse the idea that in order to understand skilful performance, one needs to take the whole agent-environment system into account. Calling someone skilled indicates that he or she manages to respond to its surroundings in an intelligent way: "one has learned to use one's judgment to modify one's performance according to the demands of the specific situation" (Bäckström & Gustafsson, 2017). It follows that the context (the demands of the situation) partly determines what skilful performance entails in that specific case.

Importantly, 'using one's judgement' does not mean that the agent must engage in complex internal inferential or computational processing. In order to see why this is so, we will look at Segundo-Ortin and Heras-Escribano's (2021) discussion of skilful performance in sports. A first example they discuss is a VR simulation of a rugby task (Correia et al., 2012) where subjects must choose to either pass the ball to a teammate or to run ahead with it. Results show that the emerging spatial gaps relative to the defenders and between defenders and teammates were the best predictors of the participants' behaviour; for example, when there was no gap available, subjects would usually keep the ball until a sufficiently large gap emerged, or they would sometimes move in order to create it. This leads Segundo-Ortin and Heras-Escribano to claim that skilful performance of this task requires perceiving and exploiting "the goal-specific information present in the ambient array" (2021, p.15). This view on skilled performance differs substantially from Bermúdez's analysis, according to which agents, before performing an action, must internally represent all possible strategies and compare them in terms of costs and benefits.

A second example Segundo-Ortin and Heras-Escribano discuss compares the behaviour of novice against expert goalkeepers in trying to anticipate the direction of a penalty kick (Savelsberg et al., 2002). Results show that while novices spend more time directing their attention to the trunk, arms and hips of the kickers, expert goalkeepers direct it mostly at the position of the kicker's legs at the moment of ball contact. According to the authors, experts are better at anticipating the direction of the penalty kicks because they have "more refined visual search patterns" (p. 283) for the task at hand. Importantly, they also found a strong correlation between the

improvement in the novices' expertise and the refinement of their visual patterns: indeed, the evidence suggests that novices became better at predicting the direction of the kick as they learned to direct their attention in the same way as expert goalkeepers. Again, Segundo-Ortin and Heras-Escribano suggest that skilled goalkeeping does not consist in mentally comparing multiple options before deciding in what direction to move. Instead, it consists in their capacity to attend to the most useful information in the environment.

According to this view, skilful performance is thus in an important sense about knowing what to look for in one's surroundings, and not so much about setting into motion a chain of cognitive control mechanisms that take place inside one's head. Crucially, it is sometimes the case that the goal-specific perceptual information required to complete the task is not immediately available in the environment, and the individual must act to find or even create it. This can be seen, for instance, in the experiment by Correia et al. (2012), where participants generated a visual aperture before passing the ball to their teammates. A situated explanation of skilled performance thus provides an account of how goal-directed agents interact with their environment (see also Raab & Araújo, 2019).

Having sketched the general outlines of a situated account of skilled performance, we can now return to the topic of self-control. In the next section, we will integrate the claims we have developed so far (that self-control is a person-level concept which should be analyzed in terms of skilled performance, and that skilled performance is situated), and describe what we think a really situated account of self-control looks like.

5 Self-control as a set of situated skills

We subscribe to the idea that self-control should be understood as a set of skills, where the relevant skills are situated in the sense that they involve, among other things, knowing what resources to look for in one's environment. Depending on the specific self-control problem at hand (such as wanting to quit smoking, or to reduce procrastination in doing administrative paperwork) skilled performance is about knowing what strategies would work best in a specific context, and knowing how to employ them. In our understanding of skills, an agent familiar with a self-control task does not need to compare possible strategies in order to select the one she judges to be the most effective. Instead, she will attend to the relevant features of the environment to perform the task at hand. For example, if confronted with boring paperwork, an agent skilled in self-control might directly conclude that in order to get some work done, she needs to clean her desk and put on some good music. The relevant environment might also be social: a recovering alcoholic who is tempted to have a drink might immediately realize that he needs to contact his sponsor to keep his resolve. In so far as agents are skilled in familiar self-control tasks, they display practical knowledge of how to work with the environment in order to succeed in the task.

However, this does not entail that explicit reasoning is never necessary; indeed, less familiar tasks often do require some form of reasoning, planning and experimenting with different strategies in order to identify the best ones. This provides a way

to explain the fact, already observed by Aristotle (in Book VII of the *Nicomachean Ethics*), that self-control is to some extent domain-specific (see also Duckworth & Tsukayama, 2015). Because skilled performance is tailored to a specific self-control task in a specific context, agents might be for example very skilled at resisting the temptation to drink, while being hopeless at fighting procrastination.[9]

At this point, one might argue that, even if organizing one's desk or calling a sponsor can be understood as 'skilfully acting on one's environment', the same cannot be said for reasoning, planning, or, say, imagining harmful environments and avoiding them; such manifestations of self-control seem to fully take place "inside our heads". We agree that exercising self-control does not always involve the performance of overt actions. However, using 'internal' strategies such as reasoning, planning and imagining is clearly *intentional activity*. Moreover, they can be seen as being part and parcel of broader strategies that usually *do* involve changing our relationship with the environment. Thinking about the need to avoid certain places is part of a larger chain of actions we perform to control ourselves, going somewhere else instead.

Secondly, we believe that just because an action is rehearsed 'mentally', it does not follow that this action is not situated in a meaningful way, nor that a situated framework would ignore the fact that we often do things "inside our heads". Briefly, it helps here to consider social accounts of reasoning as developed by Ryle (1949) or more recently Mercier and Sperber (2017). Regarding these activities Ryle claims that "[e]fficient practice precedes the theory of it" (p.19), meaning that these activities are learnt in practice and in contexts in which we are taught what is correct and what is mistaken. Knowing *how* to reason is the ability to reason in a way that is appropriate given the situation. Returning to the topic of self-control: we can be more or less skilled at deploying the activities of reasoning, planning and imagining in addressing our self-control issues: devising an elaborate plan for how to stop buying cigarettes is not 'skilled reasoning' if one's colleagues in the office constantly offer them to you.

Our claim that self-control should be understood in terms of situated skills raises the question: how do agents learn such self-control skills? To flesh this out, we want to return to Baggs, Raja & Anderson's (2020) work, in which they explain learning by means of the notion of *enabling constraints*. As already mentioned, from a situated perspective learning a new skill involves learning how to work with one's environment in an effective way. As Baggs et al. show, structures in the environments can provide constraints that enable the emergence of a new activity, so that "the environmental elements and the relation of the [agent] with them become an integral part of the learning of the skill" (p. 5). Such constraints enable the agent to perform new activities by limiting her freedom to some extent. For example, a table is an enabling constraint for a toddler who is learning the new skill of standing upright. Without the table, she would fall to the ground, even if (and in fact precisely because) the table limits her freedom to move. Hence, the process of learning can be understood as a search strategy, i.e., the agent searching for possible solutions to the task she is learn-

[9] This does not exclude the fact that being skilled in a specific kind of self-control may involve some general aspects (think for example of the strategy to remove tempting stimuli from one's visual field) that are transferable to certain tasks in other domains (Berkman et al., 2012; Tuk et al., 2015).

ing to engage in, where these solutions consist in new forms of interaction between the agent and the environment. A successful search leads the agent to find a new enabling constraint and, as a consequence, to let go of the previous one(s) (2020, p. 6). In the case of the toddler, her problem is to stand upright, and her first solution is to hold on to the table. In time, her continuing search will offer a new solution, based on the adoption of a new enabling constraint – e.g., she will learn to keep her posture by compensating the movements in her optic flow, i.e., the changes in her visual field (Lee & Aronson, 1974; Lee & Lishman, 1977). At this stage the toddler can finally "let go of the furniture because new enabling constraints have been established that render the previous furniture-holding constraint no longer necessary" (p. 6).

Applying these ideas to the learning of self-control skills, we argue that agents engage in similar searches for possible solutions. For someone learning self-control in relation to addictive substances, self-binding strategies such as making sure the substance is unavailable can function as enabling constraints. For example, taking medication that brings about a nausea response to alcohol intake, the agent directly limits her own freedom with regard to drinking. However, this might enable her to get through the difficult process of physical withdrawal. Once these withdrawal symptoms have subsided, the agent is in a better position to find other enabling constraints which could take her to the next step, such as participating in therapeutic interventions and building new habits. In every stage, finding the most relevant enabling constraints, and thus adapting the way one concretely relates to one's surroundings, is crucial for developing more and more effective solutions to self-control tasks.[10]

How exactly this learning process plays out depends on the specific features of the self-control problem at hand. However, in general one could argue that learning self-control in a particular domain proceeds roughly in the following stages. In the first stage, the agent is presented with a new self-control task, or a new motivational conflict between a temptation and her best judgment. In this stage she is akratic, i.e., she knows how she would like to act, but does not have self-control regarding this particular problem (Kalis, 2011; Mele, 2010; Tenenbaum, 2010). In the second stage, the agent starts developing the self-control skills needed to solve the problem. The learning process in this stage can take many different forms depending on the agent, her context, the strategies that are available to her and so on. For instance, someone who wants to quit smoking has several options available (e.g., going 'cold-turkey', gradually reducing the number of cigarettes smoked in a day, going to the office without taking her cigarettes with her, only bumming cigarettes from friends…), and probably has some knowledge of her own strength and weaknesses. Finding strategies that work might involve some explicit reasoning and planning about what is the best way to proceed, and comparing possible strategies to decide which one has more chances of being successful. In case a selected strategy does not work, she might take a step back to reconsider her options and then choose a different strategy. Nevertheless, the process as a whole remains crucially situated: as illustrated earlier, the

[10] A very similar suggestion is already given by William James in *The Principles of Psychology*, when he exhorts those developing good habits to "Accumulate all the possible circumstances which shall re-inforce the right motives; put yourself assiduously in conditions that encourage the new way; make engagements incompatible with the old; take a public pledge, if the case allows; in short, envelop your resolution with every aid you know." (1863, chapter IV).

search for a strategy is a search for the relevant enabling constraints, e.g., only taking cigarettes from one's friends instead of buying a pack to keep. Moreover, the skill to be practiced can include multiple strategies that facilitate its learning, where each strategy might recruit different features of the environment.

The third stage involves the agent mastering the strategy, or set of strategies, that she has selected through practice. This will be accompanied by a decreasing experience of effort. Finally, in the fourth stage, the now skilful agent will have formed a new habitual pattern of relating to her environment, as a result of which the motivational conflict that was the source of the self-control problem, might even disappear. Importantly, this stage will not be reached in all cases: while in many ex-smokers the desire to smoke might ultimately disappear, for some it will remain part of their lives until they die. In cases like these, all one can do is maintaining the practice, and try to keep improving one's self-control skills.

6 Conclusions

Our aim in this paper has been to contribute to situated approaches to self-control as they have recently gained traction in the literature. These approaches take their inspiration from a tradition which we have summarized under the heading of the Situated Cognition Thesis, which states firstly that cognition is primarily active, and secondly that in explaining cognition the focus should be on the organism as a whole as it interacts with its environment. Taking these two features as our point of departure, we have argued that existing contributions to the situated trend in thinking about self-control are in fact only somewhat situated: they ultimately remain committed to the idea that the concept of self-control refers to specific cognitive mechanisms or traits that are somehow realized by the brain. As an alternative we have sketched the outlines of a really situated account of self-control that does justice to both principles of the Situated Cognition Thesis. In our proposal, self-control is a set of skills that are spelled out as ways in which agents modulate their relation to concrete aspects of their environment. The precise set of skills agents employ will vary across persons and situations, but what singles them out as self-control skills is that the agent employs them in order to act on her best judgment in the face of conflicting motivations.

Even though we defend the view that self-control should be understood as a set of skills and not as a specific process or mechanism unfolding in the brain, we do not reject the idea that exercising self-control skills will involve processes and mechanisms, some of which will be realized by brain processes. For example, it is often suggested that response inhibition processes play an important role in cognitive control (Houben et al., 2011; Mischel et al., 2011). However, whether or not an unfolding of response inhibition processes in an individual's brain can be understood as an exercise of self-control depends on *what that individual agent is doing in what context.* What goal is the agent trying to reach? Which motivational conflict is she experiencing, and what strategy does she adopt for dealing with this conflict? The mere involvement of response inhibition mechanisms cannot give us answers to any of these questions. Instead, response inhibition is a domain-general phenomenon which plays a role in various tasks (one might for example use it in solving puzzles or in

practicing a motor skill which requires overruling certain habitual movements, as in learning to drive on the other side of the road) and is not inherently about self-control.

We would like to end the paper by briefly highlighting how the picture we sketched, and the general situated trend in our thinking about self-control, could be relevant for empirical research on the topic (for a more detailed picture see: Kalis et al., forthcoming). In our view, it calls for a different way of exploring the psychological question concerning how agents learn and exercise self-control skills. Most importantly, our claim that self-control is about relating to one's environment and finding out 'what resources to look for', indicates that self-control any study of self-control must take into account the context in which the individuals are studied. In the classic marshmallow test experiments, for instance, children might have had little choice but to stare temptation in the face. However, in our everyday lives we encounter a variety of self-control challenges in a variety of contexts. In practice, this means that empirical paradigms investigating self-control strategies and skills should take this variety into account, and examine how individuals deal with self-control issues in different material and social surroundings. One relevant trend that could support this idea is Hoffmann's experience sampling method (Dohle & Hofmann, 2017; Hofmann et al., 2014; Wolff et al., 2021) a method by which researchers can monitor participants' struggles with self-control in their own environments.

Secondly, it could be highly valuable to build on insights from the field of anthropology. For instance, ethnographic studies on addiction (Pennay & Moore, 2010; Schüll, 2012; Singer, 2012) may offer invaluable insights in people's struggles with, and solutions for, self-control problems in everyday life, paying ample attention to the role played by the material and social environments of agents. By applying the methodologies used in such studies to more everyday manifestations of self-control or its failures, one could develop a valuable research paradigm that could be labeled 'self-control ethnography'. By being geared towards investigating how agents in their concrete environments deal with real-life concerns, both experience sampling and ethnography could provide methodological tools for building an empirical account of genuinely situated self-control.

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