

Abstract

There has recently been much interest in the role of attention in controlling action. The role has been mischaracterized as an element in necessary and sufficient conditions on agential control. In this paper I attempt a new characterization of the role. I argue that we need to understand attentional control in order to fully understand agential control. To fully understand agential control we must understand paradigm exercises of agential control. Three important accounts of agential control – *intentional*, *reflective*, and *goal-represented control* – do not fully explain such exercises. I argue that understanding them requires understanding how deployments of visual attention implement flexible occurrent control, or a capacity to flexibly adjust the degree of control that individuals exercise over their actions. While such deployments of attention are neither necessary nor sufficient for exercising agential control, they constitute an attentional skill for controlling action, understanding which is central to fully understanding agential control. We can appreciate its centrality if we appreciate that this attentional skill for controlling action is plausibly crucial to acting non-negligently.

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Flexible Occurrent Control

A pianist controls her play by focusing on the structure of the passage that she is playing. A walker controls his journey home by scanning the way for obstacles. A chef controls her picking up a knife by performing quick saccades between the knife and her hand. All three individuals act intentionally. They exercise more control over their actions than if they had not attended or attended to a lesser degree. How much control they exercise over their actions is at their discretion. The pianist can shift her attention to the movements of her hands. The walker can focus on a phone conversation instead of his way ahead. The chef may move her attention to the knife, attempting to discern its exact position. In these paradigm instances of agential control, individuals flexibly control their actions by deploying attention.

In this paper I argue that:

Flexible Occurrent Control: Many individuals can flexibly adjust the degree of control that they exercise over their action, during its execution, and such adjustments are often at the individuals' discretion.¹

Discussions of agential control in action theory focus almost exclusively on providing necessary and sufficient conditions for an event's being an act. This focus has, for

¹ If it is true that individuals cannot act unless they control their actions, then there is a sense in which any action involves an exercise of occurrent control. When I refer to flexible occurrent control I intend the narrower phenomenon described in the main text. The control is occurrent because it is not merely dispositional. It is flexible insofar as individuals can adjust its degree during the execution of the action.

a long time, led action theorists to overlook how rich a phenomenon agential control is.² In this paper I will not try to provide necessary or sufficient conditions on action. We may suppose, for the sake of argument, that guidance by an intention-like, goal-representing state constitutes action.³ My interest is in describing an aspect of agential control that is *not* a necessary (or sufficient) condition on agential control. My interest is rather in discussing a component in many exercises of agential control, *beyond* whatever makes an event an action. This component allows (many) individuals to flexibly adjust the degree of control that they exercise over their action. The component allows them to flexibly exercise more or less control, as they deem appropriate. I focus on bodily action. I show that:

Attentional Control: Certain deployments of visual attention implement exercises of individuals' flexible occurrent control of action.

And I argue that:

Understanding Agential Control: Fully understanding agential control⁴ requires understanding the role of attention in exercising flexible occurrent control.

Fully understanding agential control requires understanding paradigm exercises of agential control. Flexible occurrent exercises of attentional control constitute an especially important class of such paradigm exercises of agential control. Exercises in which individuals adjust the degree of control that they exercise over an action, by flexibly allocating visual attention, are cases that we centrally appeal to when explaining the concept agential control. This capacity for flexible adjustments of control also plays an important role in the norms that govern human action – in particular, in norms of non-negligence. Such norms centrally govern exercises of an attentional skill for controlling action. This skill's centrality to norms of non-negligence displays its importance to understanding the concept agential control. So even though the capacity for flexible adjustments of control through deploying attention is not a necessary (or sufficient) condition on agential control, understanding the capacity is crucial to fully understanding our notion agential control.⁵ Therefore, full understanding of

² Several important recent discussions of motor skills bear on varieties of agential control. (See, e.g. Stanley & Krakauer 2013, Papineau 2013, Shepherd 2015, Christensen *et al.* 2015, Fridland 2014, 2017a & 2017b, and Levy 2017.)

³ See section 3 below.

⁴ In what follows I will indicate representational contents – such as concepts – by underlining them.

⁵ I will explain each point at greater length in section 4 below.

agential control requires understanding the role of attention in these cases. Or so I will argue.

Current action theory offers three major approaches to understanding agential control. The first approach tries to understand agential control in terms of individuals' reflection on their own mental states. Harry Frankfurt, David Velleman, and Michael Bratman have proposed accounts of this type. (Frankfurt 1988; Velleman 2000; Bratman 2007) The second approach attempts to explain agential control in terms of an individual's carrying out an intention to act. This approach springs from G.E.M. Anscombe's and Donald Davidson's work on action. (Anscombe 1957; Davidson 1963, 1971) On a third approach, guidance by goal-representations (that may or may not be intentions) constitutes agential control. Proponents include Alfred Mele, Jesús Aguilar, Joshua Shepherd, and others. (Mele 1992, 2000; Aguilar 2012; Shepherd 2014) Each of these approaches plausibly identifies important forms of agential control. But I will argue that none of the approaches provides the resources to fully explain paradigm cases in which individuals deploy attention to flexibly control their actions. Even Wayne Wu's recent elaboration of the third approach, while emphasizing the importance of attention in agential control, misdiagnoses attention's role.⁶ (Wu 2011a, 2014) Wu claims that deployments of attention are *necessary* for (and constitutive of) an individual's exercises of agential control. As I mentioned earlier, I reject this claim and argue that attention's importance lies, instead, in implementing flexible adjustments of the degree of control in many cases.⁷

In section 1 I reflect on agential control's flexible component and identify three of its characteristic features. In section 2 I argue that flexible exercises of attentional control implement paradigm exercises of agential control. Section 3 contains a discussion of alternative approaches to understanding agential control. In section 4 I argue that flexible occurrent exercises of attentional control constitute exercises of an attentional skill for controlling action. I argue that this skill is central to norms of non-negligence. Exercises of

⁶ The first to mention the importance of attention in action was, I believe, Christopher Peacocke. (Cf. Peacocke 1998) Since the completion of this paper, Ellen Fridland has published several papers that independently point out the importance of attention to controlling action. (Cf. especially Fridland 2017 a & b; see also her 2014, section 4.2) Her emphasis is on the role of attention in motor skills. I focus on attention as a form of occurrent control, and its role in understanding agency and agential control. But I believe that our views are largely congenial

⁷ See Section 3.3 below.

the skill hence constitute a particularly important form of agential control. We therefore need to appeal to attentional control to fully understand agential control.

1 Agential Control's Flexible Component

Reflection on agential control suggests that paradigm exercises of agential control have a flexible occurrent component:

Flexible Occurrent Control: Many individuals can flexibly adjust the degree of control that they exercise over their action, during its execution, and such adjustments are often at individuals' discretion.

In this section I want to illustrate agential control's flexible component and identify three of its characteristic features.⁸ A pianist exercises flexible occurrent agential control while playing György Ligeti's *Études*. The pianist can flexibly adjust her control over her play while performing the piece. The pianist can make more or less of an effort. She can concentrate more on an ostinato figure in her left hand. She can anticipate a particularly difficult upcoming passage. She can count beats when playing irregular rhythms. She can occurrently form a novel intention to accentuate after a pause in some specific place.

We can characterize such flexible exercises of agential control more sharply if we appreciate three of their characteristic features. First, flexible occurrent exercises of agential control are *directly* of an agent's actions. Second, such exercises *adjust the degree* to which individuals control their actions. And third, such exercises of agential control can constitute *additional exercises of agency* on the individual's part. Let me explain each of these features in turn.

First, flexible occurrent exercises of agential control are *directly* of the action. The pianist does not control her action by controlling some object or event beyond agent or action. The pianist's signaling the audience to be quiet is not an exercise of agential control over her play, even though the silence may increase her control over her play. The pianist's stabilizing her left wrist with her right hand when playing a scale constitutes indirect, not agential, control. When the pianist makes a greater effort, however, when she concentrates

⁸ Note that I am at no point offering necessary or sufficient conditions on occurrent agential control. Specifically, I do not claim that exercises of agential control necessarily exhibit the features that I will identify in this section. These are rather features by appeal to which we can characterize paradigm exercises of occurrent agential control.

on her left hand, or when she counts beats, she does then not act *upon* herself. Her making an effort, her concentrating, and her counting rather are elements of her piano playing. These additional occurrences contribute to the psychological and motor processes that immediately guide her play. The occurrences are part of the action that is her playing. If they increase the pianist's control over her action, they do so directly.

Second, agents can occurrently *adjust the degree* to which they control their actions. The pianist's concentrating, her anticipation of a passage, and her occurrent formation of an intention to accentuate can increase (or decrease) her control over her action. They can increase (or decrease) control along two dimensions. One dimension concerns the *reliability* with which the individual completes her action or brings about her action's goal. When the pianist anticipates, and concentrates on, some particularly difficult passage, she may more reliably complete the passage. The pianist is more in control of her action if she more reliably phrases the passage in the intended way. Another dimension concerns the extent to which the individual determines *details* of her action or its result. Suppose that the pianist's intention guides her play of some passage. The representation of the intended action can be more or less detailed. The pianist may intend to play this passage. She controls her action insofar as she completes the passage. Alternatively, the pianist may, while playing the piece, remember, and form the novel, more detailed, intention, to accentuate after a pause in some specific place. The individual in this latter case, if successful, exercises more control over her play than the individual in the former case. She determines more details of her play.

Third, such occurrent, flexible adjustments of the degrees to which individuals control their actions can constitute *additional exercises of agency* on the individual's part (but they need not). Whether she counts beats can be at her discretion. How much of an effort she makes can be up to her. Concentrating more on her left hand may constitute an additional exercise of agency by the pianist. We can contrast such active adjustments of control with similar passive episodes, merely automatic aspects of skills. Concentrating on her left hand may be part of an overlearned behavior that automatically occurs when she reaches a certain part of the score. She may spontaneously, but passively, count along when playing irregular rhythms. Both occurrences may increase the pianist's control, in spite of their not constituting additional exercises of agency. Similarly, the pianist's control over her play may passively decrease when murmurs from the audience divert her focus from an upcoming difficult passage.

Paradigm exercises of agential control have a flexible component. Such exercises of agential control will tend to exhibit the three characteristic features identified in this section.

2 Attentional Control

Attending to something, in its broadest, most widely accepted sense, involves the directing of processing resources towards that thing. Directing processing resources towards something normally results in faster, more accurate processing of it. Often, such directing of processing resources contributes to more successful completion of the processing's function.⁹ I will now argue that:

Attentional Control: Certain deployments of visual attention implement exercises of individuals' flexible occurrent control of action.¹⁰

Individuals in the following two cases exercise agential control flexibly.

Case 1: Walking

An individual intends to walk straight home after exiting the metro. Emerging from the metro-station he orients himself and fixates attention on the far end of the street as the first location to be reached. Relying on his perception, the individual forms the intention to walk there. The walker sees an approaching biker and anticipates collision. He fixates the biker, estimating his speed. Quick, strategic saccades between the biker and the segment of the way ahead yield a new trajectory. The walker side-steps the biker. Detailed perceptual information about the biker's speed and direction yields detailed motor commands for direction and force of his leg's movement. A precise perceptual estimate of the biker's trajectory enables the individual to precisely time his movements. (Hayhoe & Ballard 2005; Shadmehr 2012, Chapter 4)

⁹ Cf. Pashler 1999; Itti *et al.* 2005; Carrasco 2011. I do not intend for these remarks to provide an account of attention. Recently there has been much interest in the nature of attention. Cf. Wu 2011b; Watzl 2011; Smithies 2011; Mole 2011. I do not here take a stand with respect to this debate. We do not yet fully understand attention's nature. I am inclined to think that some of the attentional phenomena that common sense and psychology acknowledge will allow for a unified treatment. But I am not committed to the idea that all of them do. Nor is this belief relevant to the present paper. I rely on the idea that the phenomena described in the main text are attentional phenomena. Psychologists acknowledge them as such. Common sense supports this characterization. I am not aware of successful arguments to the contrary. [REDACTED]

¹⁰ I focus on the case of visual attention, mainly because the psychology of visual attention shifts is well understood. Similar claims seem plausible for other forms of perceptual and cognitive attention.

Case 2: Reaching

An individual intends to make a sandwich. She reaches for the knife with her right hand. Visual attention guides her right hand to the knife. Once she has completed that movement, her left hand reaches out for the lid of the jelly-jar. Her eyes lock on to the lid and track pick-up with her left hand. Suppose that, initially, peripheral vision determines the lid as the target for the individual's arm movement. Peripheral vision does so without providing much detail about size and shape of the object. Maybe initially the visual system identified the orientation and shape of the lid only approximately. Maybe the visual system slightly miscalculated its location. When the individual moves attention to the lid, new and more precise information about the location, size, shape, and orientation of the object becomes directly available to her motor system. The individual can use this novel information to adjust the trajectory of her reach. (Hayhoe *et al.* 2003; Shadmehr & Wise 2005, Chapter 12; Sprague *et al.* 2007)

These cases present paradigm exercises of agential control. The individuals in these cases adjust the extent to which they control their bodily actions by paying attention in certain ways. Let us consider how deployments of visual attention in these cases exhibit the three characteristic features of flexible occurrent control identified in the previous section.

Reflection on the ways in which visual attention helps control action in the two cases reveals a sense in which attentional control can be *direct*. When visual attention serves to control bodily action, shifts of attention often form attentional routines. Such attentional routines are highly stereotyped, quasi-automatic patterns of attention shifts. Attentional routines function to update both locations for attention shifts and information for motor commands. Visual information from such attention shifts directly feeds into the motor system's processing of the motor system's action-guiding states. (Hamid *et al.* 2010) No intermediate processing of this information is required.

Individuals in the two cases can occurrently exercise *more or less control* by attending in certain ways. Attention contributes to the control of bodily action by making more processing resources available for the action. Attention also contributes to the formation of new action-guiding states, or the updating and modification of existing action-guiding states. Many of these action-guiding states directly contribute to the formation of motor states. In the reaching case, for instance, attention makes available more precise information about the lid's location and orientation. Peripheral vision and visual memory represent inaccurately the

purported location of the reaching's target. Attention updates this remembered information and thus makes successful action possible. Furthermore, attention may shift back and forth between the reaching hand and its target. Attention thus also makes available precise information about the trajectory that the arm is completing at any given moment. This highly specific, detailed geometric information allows the motor system to adjust and update the motor state, specifying the trajectory for the individual's arm movement.¹¹

Suppose that attention contributes to the formation of more specific intentions or motor commands. Attention then increases the amount of the action's detail that the individual determines, relative to inattentive action. Attention then also often increases the degree of reliability with which the individual carries out some specific action or reaches some specific goal. We often carry out actions absentmindedly or quasi-automatically. We reach for the lid while attending to the television. We walk down the street while reading our newspaper. But we can control the execution of an action to a greater degree when we act (more) attentively.¹² Both amount of detail and degree of reliability often depend on how much attention the individual devotes to carrying out her action.

Finally, such deployments of attention exhibit the third characteristic of agential control's flexible component. Such deployments can constitute *additional exercises of agency* by the individual. We intuitively distinguish between active and passive shifts of attention. The individual can actively shift attention across the scene. She can actively initiate attentional routines. In many cases, it is at the individual's discretion whether, where, and to what extent she deploys visual attention for controlling her action. The chef may, for example, make an additional active effort to not be distracted but keep her visual attention fixated on her hand

¹¹ This role of visual attention in action has independently been noted by Mylopoulos & Pacherie 2016, section 5.

¹² Individuals may deploy attention to their bodily actions and thereby *interfere* with them. A tennis player may make a skillful return, unless he attends to how he should move his arm. A pianist misses a difficult jump as soon as she attends to the movements of her fingers. Not *all* attending enhances bodily action. Individuals may fail to attend to the right things. Maybe the pianist should not attend to her fingers, but to the general structure of the piece that she is playing. Psychologists have found that, often, successful execution of an action requires not attending to one's own body. Rather, say, the tennis player should fixate some location close by where the ball will bounce. Learning a motor skill often requires learning where to attend. (Wulf, G. 2007; Land & Tatler 2009) Attention can interfere with the execution of an action, even if the individual deploys attention in the right way. Increasing the reliability of actions' successful execution is just one of attention's functions in animals that act. Attention can sometimes fail to fulfill its function. The possibility of failure to fulfill its function is compatible with the fact that, in many cases, attention contributes to occurrent agential control. For nuanced discussion of the connection between attention and skill that is in broad agreement with these claims, see Montero 2010, esp. section 5 & 2016, Papineau 2015, Wu 2016 and Fridland 2014, section 4.2 & 2017a, 1552ff.

as it approaches the lid. When shifts of attention that help control an action are active, then the additional exercise of agential control is an active exercise of control. But deployments of attention need not be active. Shifts of attention during attentional routines often do not constitute additional exercises of agency. The chef may shift attention to guide her arm's movement without making an additional active effort. She may pay attention automatically, as part of an overlearned motor skill for making a sandwich. Such shifts nevertheless can contribute to her action's control.¹³

The cases discussed in this section present paradigm exercises of agential control. In these cases, individuals deploy visual attention to control their action. Their deployments of visual attention exhibit the three characteristic features of flexible occurrent control. I conclude that deployments of visual attention can implement such exercises of agential control.

3 Reflective, intentional, and goal-represented control

In paradigm exercises of agential control, attentional control is exercised occurrently. In this section I reflect on the extent to which three influential approaches to agential control provide the resources for understanding these paradigm exercises of agential control.¹⁴ My discussion here should not be understood as a criticism of these approaches. Each plausibly identifies an important form of agential control. Rather, I am interested in whether the resources that these approaches provide suffice to capture the flexible component of agential control that I identified. I argue that to fully explain this form of agential control, we must *also* appeal to a competence for attentional control. I argue that the three approaches' explanations of agential control are incomplete, unless they appeal to such a competence.

3.1 Reflective and intentional control as too exclusive

In its generic form, the reflective approach to agential control maintains that

¹³ Sometimes it is said that highly stereotyped, automatic processes could not be *individuals'* processes, but have to be processes of a sub-system. I see no reason to accept this claim. Many of our actions – such as walking, swimming, tying shoelaces – are highly stereotyped and automatic. They are nevertheless actions by the individuals that perform them.

¹⁴ Typically, these approaches are presented as offering necessary and sufficient conditions on agential control. I will not discuss them as such.

Reflective control: An individual's exercises of agential control over her bodily action consist in some specific higher-order, reflective state's guidance of that bodily action.¹⁵

Suppose that one of the individual's motivating states, such as a desire, causes a movement by her body. The individual's agential control consists in the guidance of the movement by one of the individual's higher-order states. The higher-order state's content specifies the first order state as one by which the individual wants or intends to be moved to action. Several versions of this reflective approach have been offered. Harry Frankfurt appeals to higher-order volitions of the individual. (Frankfurt 1988, 14ff.) A person exercises agential control over her action just in case she has a higher-order desire to be moved to action by her relevant first-order desire. Michael Bratman appeals to higher-order policies. (Bratman 2007, 32, 36 & 41) Higher-order policies are higher-order intentions to be moved by certain desires or considerations to act, in potentially recurring circumstances. David Velleman invokes individuals' higher-order controlling consciousness of their act. An individual exercises agential control if and only if she has controlling consciousness or directive knowledge of her behavior. (Velleman 2000, 193-6) These authors are primarily interested in explaining autonomous, self-governed agency.

Proponents of the intentional approach to agential control claim, roughly:

Intentional Control: An individual's exercises of agential control over her bodily action consist in her intention's guidance of that bodily action.¹⁶

Intentions are propositional states, possible elements in practical reasoning. (Burge 2010, 539ff.) An individual's agential control, on the intentional approach, consists in an intention's initiating and sustaining the motor system's activities. The intention initiates activity of the motor system that causes the individual's muscles to move. The intention guides an action by causally sustaining the activities that serve the action's completion. The motor system computes sub-steps of the action's execution in light of the intention and incoming feedback from different senses. This approach originates with G.E.M. Anscombe and Donald Davidson. John Searle is a more recent proponent. (Searle 1983, 85ff.) Authors within this approach intend to explain exercises of agency governed by practical reason.

¹⁵ Cf. Frankfurt 1988; Velleman 2000 & 2009; Bratman 2007

¹⁶ Anscombe 1957; Davidson 1963; Davidson 1971; Searle, 1983; Bratman 1987; McDowell 2010.

Each of these two approaches describes important forms of agency. But do they provide the resources to account for paradigm exercises of flexible agential control?¹⁷ We know that many animals other than humans have visual attention. These animals can deploy attention for the occurrent control of action. Thus an animal as comparatively simple as a pigeon can deploy attention for search during foraging. Animals as relatively primitive as jumping spiders can navigate the rain forest, guided by visual attention. (Cross & Jackson 2010; Jackson & Cross 2011; Zuberbuehler & Janmaat 2010; Fowler & Sherk 2003) Even in these animals, deployments of attention plausibly can implement occurrent adjustments of these individuals' control over their actions.

Many animals that do not have conceptual intentions flexibly exercise agential control. Pigeons and cats may not have conceptual intentions. Spiders very likely do not have them. None of these animals have higher-order states. We would nevertheless firmly distinguish between a cat's attentively placing one paw in front of the other while traversing the ridge of a roof, and her being distracted by a bird's flying past her head while walking. She is likely more in control of her action in the former than the latter case. Humans that have conceptual intentions but do not have higher-order states exercise variable degrees of occurrent agential control. Human infants before age four may not engage in higher-order thought. (Wellman 2014) We can distinguish between a human infant's attentively reaching for a toy and his doing so distractedly, upon turning his head towards the source of a familiar tune. The infant is likely more in control of what he is doing when he pays attention to his action. (Adolph 2008)

All these individuals plausibly can adjust the degree of control that they exercise over their action, while they are executing it. *Reflective control* does not provide the resources for explaining occurrent exercises of agential control in animals without reflective or higher-order states. *Intentional control* does not provide the resources for explaining such occurrent exercises in animals without propositional states. The competences that both approaches appeal to are too sophisticated to account for paradigm flexible exercises of agential control. Appeal to competencies underlying *attentional control*, on the other hand, helps naturally explain such non-sophisticated exercises of agential control.

¹⁷ The argument in this section is indebted to Burge 2009. Attentional control does not play a role in even more primitive exercises of agential control by animals that do not have psychologies.

3.2 Goal-represented control as not fully explanatory

The intentional approach seems to allow for an easy fix. Its proponents might acknowledge that intention-like states that are not propositional thoughts guide action:

Goal-represented control: An individual's exercises of agential control over her bodily action consist in her goal-representation's guidance of that bodily action.

Alfred Mele may have been the first to consider this proposal.¹⁸ Many recent action theorists seem to favor it.¹⁹ The animals mentioned in the last section plausibly have perceptual representations. So they may well have perceptual, image-like representations of their action's goals. Such goal-representations may initiate and sustain bodily actions in much the way that propositional intentions were said to. On the present proposal, the guidance of an action by *either* propositional *or* image-like goal-representations constitutes an exercise of agential control.

Does this revision of the intentional approach provide the resources to explain occurrent control? Recently, Jesús Aguilar and Joshua Shepherd each independently expanded *goal-represented control's* resources.²⁰ Both Aguilar and Shepherd emphasize that the approach is incomplete unless it acknowledges that agential control is a function of the reliability with which an agent can successfully attain some represented goal.²¹ Skilled individuals can employ slightly varied behaviors to realize their goals when faced with obstacles or wayward situations. Such individuals more reliably attain their goals than less skilled individuals. Aguilar and Shepherd identify a way in which individuals can exercise more or less control over an action. Also, a goal-representation's guidance of an action through skill is plausibly direct. Such guidance does not, for example, require that the individual act upon herself, in order to increase her control over her action. Might proponents of *goal-represented control* not resort to postulating ever more specific skills that could account for other dimensions of occurrent control? Might they not stipulate skills for

¹⁸ Cf. his Mele 1992; also Mele & Moser 1994; Mele 2000.

¹⁹ See Aguilar 2003; Aguilar 2012; Shepherd 2014; Wu 2011a; Pacherie 2006 & 2008; Butterfill & Sinigaglia 2014; Brozzo 2017. An extended argument for the goal-represented approach can be found in Nanay 2013. For arguments against explanations of agential control merely in terms propositional intentions, see Fridland 2014 & 2017a, and Levy 2017. For arguments to the contrary, see, e.g. Stanley & Krakauer 2013.

²⁰ Cf. Fn. 22

²¹ See Shepherd 2014, 395-411; Aguilar 2003, 93 and Aguilar 2012, 3, 4, 6 & 9. Both frame their accounts in terms of 'intentions,' but only require that an intention involve the representation of a goal.

occurrent adjustments of detail, and skills whose exercise constitutes additional exercises of agency? Have they then not fully explained agential control's flexible component?

Aguilar and Shepherd point out an important aspect of agential control. But I do not think that the philosophical postulation of such generic skills would constitute a sufficiently full explanation of flexible occurrent control.²² Such a postulation would not fully explain *how* individuals exercise occurrent control over their actions. Generic appeal to such skills does not explain how more detailed or accurate goal-representations are formed during the execution of the action. Such appeal does not explain how more detailed or accurate information improves computations in the motor system so as to increase the individual's control over her action. Remember the case of the chef reaching for the lid of a jar. How does this individual exercise flexible control over her reaching movement? How does the individual use novel visual information to form more specific goal-representations? Which of the individual's competencies enables flexible occurrent adjustments of her movements? The postulation of a generic skill for flexible adjustment of an action's details would not provide answers to these questions. A *full* explanation identifies the competence through which the individual selects novel information from visual perception during the execution of the reaching movement. Such an explanation identifies the competence through which the selected information causes the motor system to update the motor command for the trajectory of the arm. Full explanation of these paradigm exercises of agential control requires us to identify which of the individuals' competencies constitute the relevant skills and implement flexible occurrent control. But it is precisely the individual-level skill for attentional control that has all the features of flexible control, *and* is sufficiently non-sophisticated to underlie paradigm exercises of flexible control in humans and other animals.

3.3 Attention as not constitutive of agential control

Wayne Wu has recently highlighted the importance of attention for action. Wu accepts *goal-represented control* as the framework for explaining agential control. But he, too, points out that *goal-represented control* is incomplete, as long as it does not provide a role for attention. While I agree with Wu on this last point, I disagree with Wu's diagnosis of the role

²² To be sure, neither Aguilar or Shepherd propose such postulations. Their primary concern is not with explaining occurrent exercises of control, but rather with providing necessary and sufficient conditions for action.

of attention in action. For Wu, attention partly constitutes agential control. In particular, Wu claims that deployments of attention are *necessary* for an individual to exercise agential control.²³ I believe that this last claim is probably false. We must hence find a different way of understanding attention's importance for action.

Remember the walker on his way home. We can imagine him exiting the metro, his attention entirely devoted to reading a newspaper. He has the intention to walk home. Unless he encounters obstacles, the individual need not attend to what he is doing. Yet he acts, and exercises agential control over his movements. These points seem intuitively obvious. Why does Wu claim otherwise? Wu grounds his claims to the contrary in his conception of attention: "S attends to X if and only if S selects X for action."²⁴ Attention, according to Wu, just *is* the establishment of a "'one-one link' associating a specific target to a specific response, where the relevant information from the target informs the production of the response."²⁵

Does the walker *select* information for his action while executing it? The walker's motor system computes the direction in which to walk by matching peripheral vision of landmarks to a long-term memory of the scene. The system registers optic flow for programming movements. The system computes gait from proprioceptive information about the individual's limbs. The individual has a richly detailed visual percept of the visual scene. Peripheral percepts of a shape and a color, together with a memory of an obstacle, may influence where he puts his foot next. The use of this information for programming bodily movements seems entirely due to his motor system's well-functioning.²⁶ Wu apparently assumes that *any* psychological processing of states and events for generating behavior qualifies as the individual's selecting these states and events for action. But we would not normally describe the walker as 'selecting' any of this information.²⁷

²³ Cf. Wu 2016, 1. See also also Wu 2011 a, b & Wu 2014.

²⁴ Wu 2014, 96

²⁵ Cf. Wu 2011, 53. While Wu introduces his account of action and attention in the context of 'many-many problems' of mapping one of many possible inputs onto one of many possible behavioral response, Wu does not think that action necessarily requires solving such a problem. See also Wu 2014, 81: "A many-many mapping is not essential. Rather, what is essential is the need for input-output coupling."

²⁶ The individual acts nevertheless. His control consists in his intention's role in causing the action, and the exercise of his motor skills. (Cf. Luthra 2016)

²⁷ Wu emphasizes that only individual-level states can be inputs of the relevant kind. Individual-level states, for Wu, are psychological states. See e.g. Wu 2014, 87/88. When characterizing the relevant kind of selection, he writes that it is "selection of a specific input to inform a specific response" (Wu 2011b, 12) or, any processing of "relevant parameters [that] stand in the right relation to the subject's attunement" (Wu 2011b, 11). Indeed, Wu provides an argument that the agent *must* count as selecting such response-informing

While I find Wu's claims about selection implausible, my main interest is in the alleged necessary connection between attention and action. Grant, then, for the sake of argument, that the walker 'selects' information for action. Does such use of information for action plausibly constitute deployments of attention? I think not. I mentioned that, intuitively, the individual need not deploy *any* attention to his action. His attention is devoted to his newspaper. More detailed reflection on the case of the walker further supports this intuition. The amount of information used to program even simple actions can be vast. Optic flow, peripheral vision, proprioception, and long-term scene memories merely form a small sub-set of this information. While all this information is selected-for by the individual, according to Wu, it seems not merely implausible to claim that the individual attends to all this information. As a matter of fact, these different types of states are standard examples of typically non-attended stimuli.

Behavioral studies provide some additional support for this intuition. Wu identifies navigating obstacles in walking as a kind of action that requires visual attention. (Wu 2014, 89) But there is evidence that individuals can navigate even a difficult obstacle course without having to visually attend to information relevant to their walking. (Franchak & Adolph 2010) When individuals perform a scavenger hunt for star stickers while navigating the obstacle course, they hardly fixate their eyes on information pertinent to their walking. Even when negotiating an obstacle requires stepping onto it, stepping down from it, or stepping over it, individuals fixate the obstacle in only 31.8% (for one subject, in 8.7%) of cases. Visual attention and fixations of the eyes often coincide. So individuals probably need not rely on visually attended information for their navigation. They can use peripheral, unattended information from optic flow, instead.²⁸ To be sure, we know that attentional modulation is often not limited to where the eyes fixate. Often, modulation spreads across the visual field. (Datta & DeYoe 2009) But we also know that during visual search, attentional modulation tends to primarily impact processing for features that individuals search for. (Ling et al. 2014) We would need independent reason to think that in these

information (for otherwise a sub-system, and not the agent, controls the act). Cf. Wu 2014, 90, 91 & 97. See also Wu 2016, 8: "Selection' might suggest to some readers that the agent must do something else (selecting) in order to act. In fact, the idea is simpler. We have appropriate selection when a subject's perception of the environment is coupled to and thereby informs the production of a response."

²⁸ Franchak & Adolph 2010, 9. Further support derives from clinical studies showing that patients with loss of peripheral vision or 'tunnel vision' have great difficulty navigating their environments. They often stumble or collide with obstacles. Cf. Geruschat *et al.* 1998.

specific cases attention *also* modulates processing of features relevant to the individual's walking.

None of these considerations *shows* that attention is not involved in the control of action in these cases. But they further support our intuitions about these cases. What is Wu's argument to the contrary?²⁹ Wu observes that in psychology, researchers test individuals' capacity to attend on the basis of their performances on certain tasks. Wu cites the dichotic listening task, visual search, and the spatial cueing tasks.³⁰ He writes: "[In each of these cases] a well-defined experimental task establishes conditions such that when they are fulfilled, the experimenter is confident that the subject has deployed the capacity the experimenter is studying [, i.e. attention.]" (Wu 2014, 38) Wu takes this claim to support the more general claim that "subject S perceptually attends to X if S perceptually selects X to guide performance of some experimental task T, i.e., selects X for that task." (Wu 2014, 39) This claim in turn is said to support the contention that: "If S perceptually selects X for bodily actions, then S perceptually attends to X." (Wu 2014, 84) Wu's justification for this stronger claim is that "there is nothing special about the tasks that give psychologists special access to attention. ... Given that the behavioral capacities that underwrite performance of experimental tasks are of the sort routinely performed in mundane actions, there is no principled reason to divide experimental tasks from mundane bodily actions such as kicking a ball." (Wu 2014, 84) Next, Wu suggests that there is similarly no reason to restrict the relevant selection to bodily action. Instead, one should accept that any 'selection' of information for action constitutes attention.

I do not think that this argument is successful. Wu moves from the observation that specific tasks test for attention to the claim that *any* use of perceptual information for performing a task constitutes attention. But this step is not warranted. The tasks that Wu cites are carefully crafted to test individuals' capacity to attend. Much sophistication is required to devise the right kinds of tasks for testing attention. Sometimes it is controversial whether some specific tasks tests attention or some other capacity. Scientific method offers ways of resolving such controversy. Precisely for this reason we cannot generalize to the

²⁹ Cf. Wu 2014, 90f. & Wu 2016, 8f.

³⁰ In the dichotic listening tasks, individuals hear different verbal inputs on each ear. They are asked to attend to information from only one ear and 'shadow,' or verbally repeat, it. (Cherry (1953) In visual search, individuals must detect a search target (such as some specific shape) among an array of distractors. (Treisman & Gelade 1980) The spatial cueing task, too, asks subjects to detect a target. In this paradigm, different types of cue inform (or misinform) subjects about the target's location. (Posner 1980)

claim that any use of perceptual information for completing a task constitutes attention. For the same reason we cannot generalize to the claim that any use of perceptual information for any kind of bodily action constitutes attention. Specific experimental tasks in psychology plausibly test for attention, *because* they were carefully devised to do so. But no such constraint applies to ordinary bodily action. So at this point the evidence seems to favor denying the constitution claim.³¹

I conclude that three major approaches to agential control fail to provide the resources for fully explaining paradigm exercises of agential control: flexible exercises of attentional control. Even an important recent elaboration of these approaches, while invoking a competence for attentional control, misdiagnoses its role in controlling action. As I said earlier, it is an important insight that there is a special role for attention in agential control. If this role of attention does not lie in its constituting agential control, how else should we conceive of it?

4 Non-negligence and understanding agential control

Attentional control is central to our conception of agential control. We saw that flexible exercises of attentional control are paradigm exercises of agential control. In this section I want to argue that they are especially important paradigms of agential control. We must hence understand them to fully understand agential control. Why is attentional control an especially important form of agential control? Because the ability to flexibly control an action – especially through skilled deployments of attention – is a central aspect of acting non-negligently. Norms of non-negligence require individuals to flexibly control their actions. In many circumstances, these norms require individuals to exercise an attentional skill for controlling their acts. Negligent action, roughly, involves a failure to exercise due care with respect to applicable moral and practical norms, where this failure does not involve a deliberate or reckless violation of the relevant norms.³² Negligent action need not have a bad outcome. Agents can be negligent but get lucky in that they do not harm anybody. Where a malicious agent directly violates some given norm, a negligent agent does not pay

³² I take this characterization from Shiffrin 2017. See also Herman 2017 and her “The Moral Side of Non-Negligence,” [MS]. I am here not concerned with the legal notion of negligence. Instead, I focus on the notion of practical and moral negligence.

sufficient attention to how her actions and her own condition affect her ability to satisfy other duties and responsibilities. We naturally speak of a failure to pay attention to what matters, when characterizing negligent action.³³

Consider, again, the individual who walks home from the metro, immersed in his newspaper. Suppose that he crosses a crowded boulevard. The individual may make it home without hurting anybody. Maybe he owes this happy situation to everybody else's circumspection. Maybe he is just lucky. But he is acting negligently. If he collides with another pedestrian, he may be morally at fault – even though he is neither malicious nor reckless. He may be at fault because he causes harm negligently. He should pay more attention to his surroundings.

Next, re-consider the chef. Suppose that she is new to her workspace. Making the sandwich during her break, she is immersed in a conversation with her colleague. While spreading butter and jelly, her attention is entirely focused on her interlocutor. She puts too much jelly, too little butter. Both are spread unevenly. The chef leaves a mess on the counter. Naturally, she does not intend to make the sandwich poorly. Nor is she reckless in making it while conversing with her colleague. But she acts negligently. She should pay more attention to the sandwich that she is making.

Often the requirements on non-negligent actions are more complex. For instance, non-negligence often requires shifting attention in anticipation of what will be of relevance for acting well. Consider this new case.³⁴ Your spouse returns from work. She had an important interview today. She is the kind of person that does not talk about things that burden her. But you know that it helps her if you make her talk. You spent the day working on a paper. When she comes home, you ask her about her day. She replies that everything was fine, and you start blurting out all the new ideas you had for your paper. She feels neglected and you hurt her feelings. Several things went wrong. You should have remembered that today was important for her. When she arrived, you should have noticed that she looked uneasy. You should have heard the fragile undertone in her voice. Both should have reminded you of her interview. You should have been more focused on her than on yourself. You were neither malicious, nor reckless, of course. You were negligent. In

³³ See also Murdoch 1970. My position here seems largely consistent with that of Ellen Fridland in her 2017b. While she emphasizes the role of attention as a moral virtue, I emphasize the centrality of attentional skill to acting non-negligently.

³⁴ [REDACTED]

this case, negligence has non-occurrent components, such as exercising forethought. But the case also features an occurrent component. While talking to your wife, you should have deployed sufficient perceptual attention – visual and auditory – to gauge how she was doing. Not doing so makes your interactions with her negligent.

In each of these three cases, non-negligent action requires the exercise of occurrent agential control. In each of these cases, individuals poorly exercise their ability to flexibly adjust control over aspects of their action. The protagonists should acquire visual information about the environment, monitor their own movements, and seek out novel information relevant to acting well. In each case, meeting norms of non-negligence requires the agents to occurrently exercise attentional control. The protagonists should attend to the right things, and to the right amount. The chef need not ignore her interlocutor while she is reaching for the knife. It will be enough if she attends to a higher degree to her hand's movement, when the hand approaches the blades. Attending in these ways is at these agents' discretion. Plausibly, this fact helps explain why we can blame them for not paying attention to what matters.

Attentional duties of non-negligence are ubiquitous. This fact does not entail that we are morally obliged to attend to everything, all the time. Nevertheless, in many cases, non-negligent action must be flexibly controlled, to a sufficient degree, by deploying attention in the right way. I also do not want to claim that norms of non-negligence are exhausted by considerations of what to attend to. Often, more is required for acting non-negligently. Non-negligence may require additional reasoning or reflection. But the three cases suggest that paying attention to what matters forms a crucially important way of being non-negligent. Such reflection supports my claim that attentional control is an especially important form of agential control.

How, finally, is understanding attentional control required for fully understanding agential control? Understanding paradigmatic exercises of agential control yields a form of explicational understanding of agential control. Cases like that of the pianist, walker, and chef, but also the cases involving other animals, are cases that we standardly appeal to when explicating the concept.³⁵ In explaining how these individuals occurrently control their

³⁵ Explicational understanding provides principles that illuminate a concept and guide its application. We provide such understanding when asked to explicate the notion. We develop such explications by appeal to paradigmatic instances of the concept. We make reference to characteristic features of such instances in our standard explanations of agential control. An ability to provide such explications is typically sufficient for

actions we must describe how they deploy attention to this end. These cases yield an especially important kind of explicational understanding because the ability to occurrently control actions by deploying attention shapes our expectations and predictions for each other and ourselves. Among other things, the ability is crucial to understanding non-negligent action. We must understand this form of control if we are interested in understanding full moral agency. Understanding a notion involves more than understanding necessary or sufficient conditions on its referent. Our understanding of a notion would be incomplete, if it did not encompass especially important forms of explicational understanding. Such explicational understanding of agential control, hence, requires understanding attention's role in implementing occurrent control. I conclude that:

Understanding Agential Control: Fully understanding agential control requires understanding the role of attention in exercising agential control.

5 Conclusion

In this paper, I have argued that an attentional skill implements agents' ability to flexibly control their actions. I further argued that this skill is central to norms of non-negligence and that exercises of the skill hence constitute a particularly important form of agential control. We, therefore, would not have fully understood agential control without understanding attentional control.

attribution of the concept to a speaker. Cf. Burge 1993 & Burge 1986. Indeed, attentional control plausibly informs our generic understanding of agential control, which captures default generalizations about characteristic features of kinds. Often these are features that strike us as particularly important or are of special interest to us. Generic statements such as "agents can occurrently control their actions" ring true. I explained earlier how they capture important generalizations about agents' capacities. We would not have understood something important about agential control, without acknowledging its occurrent component. Cf. Leslie 2008.

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