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DISCUSSION NOTE

Motor Intentions and Non-Observational Knowledge of Action: A Standard Story

Olle Blomberg[1*] & Chiara Brozzo[2*]
[1]Lund University and University of Copenhagen
[2]University of Tübingen

According to the standard story given by reductive versions of the Causal Theory of Action, an action is an intrinsically mindless bodily movement that is appropriately caused by an intention. Those who embrace this story typically take this intention to have a coarse-grained content, specifying the action only down to the level of the agent's habits and skills. Markos Valaris (2015) argues that, because of this, the standard story cannot make sense of the deep reach of our non-observational knowledge of action. He concludes that we therefore have to jettison its conception of actions as mindless bodily movements animated from the outside by intentions. Here we defend the standard story. We can make sense of the reach of non-observational knowledge of action once we reject the following two assumptions: (i) that an intended habitual or skilled action is a so-called *basic action*—that is, an action that doesn't involve any finer-grained intentions—and (ii) that an agent, in acting, is merely executing one intention rather than a whole hierarchy of more or less fine-grained intentions. We argue that (i) and (ii) are false.

Keywords non-observational knowledge of action; Causal Theory of Action; intentions; motor representations; Markos Valaris; basic actions; habit; skill; reductionism

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1 Introduction: The standard story and non-observational knowledge

Suppose that you are making an omelette for the first time in your life. The activity as a whole is the product of your intentional agency, but so are many subsidiary actions that are parts of the activity: your chopping the onion, your heating the pan, and so on. For each of these, you could answer the question "Why?"—why you are doing it. For example, you might answer: "I'm chopping the onion because I'm making an omelette". Furthermore, you would typically know *what* you were doing—chopping the onion—without observing what was happening to your body and then inferring what you were doing. Of course, your perception plays an important role in monitoring and keeping your action on track. But what provides you with the knowledge of what you are doing isn't your perceptual observation of what is happening to your body (Falvey 2000).

One reasonable desideratum for a theory of human action is that it be able to explain how such non-observational knowledge of what one is doing is possible. According to the

Correspondence to: E-mail: olle.blomberg@gmail.com
*The authors contributed equally to this work.

standard story given by the Causal Theory of Action — *the standard story* for short — an action, whether subsidiary or not, is an intrinsically mindless bodily movement that is appropriately caused and coordinated by a mental state. We will assume, as in many versions of the Causal Theory of Action, that this mental state is an intention. Typically, this intention to ϕ also provides the agent with non-observational knowledge that she is ϕ-ing (e.g., Paul 2009; Setiya 2008; Velleman 1989). According to the standard story, it is thus your intention to chop the onion that provides you with the non-observational knowledge that you are chopping it.

Now, suppose that you are an award-winning expert omelette chef with decades of experience behind you. You intend to make an omelette and then simply proceed to do so on autopilot. In this scenario, let us suppose that there is no need for conscious deliberation or reasoning. You do not need to, and you normally would not, consciously form an intention to perform each of the aforementioned subsidiary actions. But would you normally have non-observational knowledge of performing the subsidiary actions in this case? Would you non-observationally know that you were chopping the onion? And would you non-observationally know that, as part of that chopping, you were making a particular downward stroke with your knife against the cutting board?

According to Markos Valaris (2015), many proponents of the standard story would, at least with respect to the last question, have to answer: "No, you wouldn't". This is because it appears that there would not be "enough appropriate mental states around to 'animate' all of the bodily movements" and provide this relatively detailed non-observational knowledge (ibid, p. 64). This, Valaris claims, shows that the standard story should be abandoned. In this paper, we will defend the standard story against his argument.

The standard story that is targeted by Valaris is a reductive one. It is thus committed to the claim that an intentional bodily action consists of a combination of a bodily movement, which is intrinsically non-intentional and mindless, and a mental state that makes this movement intentional by causing it in an appropriate way, where the relevant mental state can be characterised without circular reference to intentional action (see Valaris 2015, pp. 66, 71).[1] This reductionist commitment will become relevant at the end of Section 5, where we discuss a potential objection to our defence of the standard story.

2 Intentions in skilled and habitual action

Valaris's diagnosis is that proponents of the standard story can only make sense of non-observational knowledge of what one is doing under a certain description by appeal to an intention to perform the action under that description. He never explicitly articulates the diagnosis in this way, but it follows from the combination of his assumption that non-observational knowledge of an action is necessary for it to be intentional (see Valaris 2015, p. 70) and his conclusion that the only way in which the standard story can explain the intentionality of actions is by appeal to goals (ibid, §. II.1) or plan-like intentions (ibid, §. II.2). For the purposes of this paper, we will assume that his assumption and his conclusion are true. Now, the reason that many proponents of the standard story would have to deny that you would non-observationally know that you were making a

certain downward stroke with the knife as part of chopping the onion is this: they take the finest-grained intention that an agent is acting on to be typically very coarse-grained. Given that it is an agent's intention to ϕ that provides her with non-observational knowledge that she is ϕ-ing, this implies that agents will only have non-observational knowledge of what they are doing at this coarse-grained level of description.

For instance, Bratman (1984, p. 401) claims that "my intentions and plans are typically at a level of abstraction appropriate to my skills". A basketball player's intention may merely specify his action of shooting a jump shot, but not that he should stop on his left foot even if stopping on his left foot is a proper part of the larger action (ibid). Other proponents of the standard story take the finest-grained contents of intentions to be specified at the level of basic actions.[2] This is how Searle defines a basic action: "*A* is a basic action for an agent *S* iff *S* can do *A* and *S* can intend to do *A* without intending to do any other action by means of which he intends to do *A*" (1980, pp. 65–6; see also Enç 2003, ch. 2; Ludwig 2016, pp. 67–68; Pacherie 2008, pp. 198–99). The idea is that practical reasoning bottoms out into an intention to do something that one can intend directly, without intending something else by means of which one does it. Now, Searle, Enç, Pacherie and Ludwig (as well as many others) take basic actions to be relative to the agent's skills and habits, so they can be quite large and complex units of activity, such as executing a trill (Pacherie 2008, p. 199) or a whole musical phrase on a piano (Enç 2003, p. 54), tying one's shoelaces (ibid, p. 70), or serving in tennis (Ludwig 2016, p. 80). In light of these examples, chopping an onion could certainly be a basic action.

3 The challenge: non-observational knowledge of sub-habitual actions

As Valaris (2015) points out, that intentions representing basic actions often subsume very complex activities implies that agents will often only have non-observational knowledge of what they are doing at such a coarse-grained level of description. To be more precise, agents will lack non-observational knowledge of actions that are subsidiary to what they can do skilfully — sub-habitual actions, for short. Now, Valaris submits that we actually have detailed non-observational knowledge of many of our own sub-habitual actions. For example, he discusses the following scenario involving a character named Raji, who gets up to get a glass of water from the kitchen. About Raji's action, Valaris writes:

> Taking a single step is itself a complex action, composed of many smaller movements. […] I contend that such movements — placing a foot in front of the other, shifting her weight forward as she lifts her other foot and swings it forward, etc. — are also *intentional actions* on Raji's part. […][S]he certainly knows, non-observationally, that *she is moving her body in the way required for walking*. (Valaris 2015, p. 70)

According to Valaris, Raji has non-observational knowledge of all the sub-habitual actions involved in getting a glass of water from the kitchen — for example, placing one foot in front of the other — what we might call the *instrumental structure* of the action. He contends that non-observational knowledge of her sub-habitual actions is not merely knowledge of what she is doing under the broad description 'moving my body in the way

required for walking' (ibid). This is because this description would pick out not only the sub-habitual actions she is performing, but also side effects not part of the instrumental structure of the action, such as, for example, increased heart rate. By contrast, according to Valaris, an account of the agent's non-observational knowledge needs to pick out all the sub-habitual actions of which the agent has non-observational knowledge, while leaving out side effects such as increased heart rate. But there is no room for such intentional actions if, following some prominent proponents of the standard story, basic actions are identified with actions that an agent can intend to perform directly by relying on her habits and skills.

Valaris argues that, in order to provide this account of the deep reach of our non-observational knowledge of what we are doing, we have to jettison the standard story and its conception of actions as mindless bodily movements that are animated from the outside by intentions. Instead, we should embrace a non-reductive position according to which bodily movements are themselves minded and cognitive events.

While we doubt that an agent's non-observational knowledge of what she is doing is as comprehensive and fine-grained as Valaris seems to think it is, he has nevertheless highlighted what appears to be a serious problem for the standard story. It is implausible that an agent's non-observational knowledge of what she is doing does not reach below her habits and skills. This would suggest, counterintuitively, that experts have less knowledgeable agency and control over what they are doing than novices. Of course, it is true that an expert need not consciously attend to and think about the subsidiary actions that she is performing. It is sufficient that their performance is consciously and non-observationally accessible to her. But non-observational knowledge of action is standardly thought of as not necessarily occurrent and conscious: it is often unconscious and/or dispositional (see, e.g., Moran 2004, p. 59–60; Setiya 2008, p. 389; Velleman 1989, p. 47 n. 1). So, on this standard conception, experts may well have non-observational knowledge of sub-habitual actions. The challenge Valaris poses to the standard story is how to account for the fact that agents have non-observational knowledge of what they are doing below the level at which their conscious practical deliberation gives way to what seem to be mere habit and skill.

4 Motor intentions: Intentions fit for sub-habitual actions

We will argue that the standard story can be defended against the problem that Valaris poses. What his argument shows is that proponents of the standard story must distinguish between two things. One is the finest level of grain at which an agent's intention represents an action, and the other is the level of grain below which the agent need not consciously deliberate but can instead rely on habit and skill in executing the action. There are plenty of component actions of an agent's habitual and skilled actions that she performs without deliberation but which are nevertheless intended, such as the downward stroke of the knife that the expert makes as she is chopping the onion (because she is making an omelette). These are what we might call *intended sub-habitual actions*. But it would be wrong to conclude that they are therefore sub-basic actions.

As we will illustrate later, the intentional control of such sub-habitual actions is likely to involve having intentions whose content reaches below that of our habits and skills. The finest-grained of such intentions, we propose, are *motor intentions* (Brozzo 2017). The notion of motor intention builds on recent work in cognitive neuroscience on the role of motor representations in action control. Motor representations are representations of an action in the brain that are apt to cause the movements that are going to be performed (Jeannerod 2006; see also Butterfill and Sinigaglia 2014; Ferretti 2016). A motor intention is an intention that matches a motor representation in terms of what is represented. There is evidence that a single action is simultaneously guided by several motor representations that can be hierarchically ordered from more determinable to more determinate represented states of affairs (e.g., something being grasped and something being grasped with one's hand — see Rizzolatti et al. 1988; Jeannerod 2006). Down to a certain level of grain, such a hierarchical ordering is mirrored by the subject's motor intentions.[3] Below that level of grain, motor representations do not have matching motor intentions.[4] Motor intentions count as intentions under the most stringent criteria: what they represent is consciously accessible, they are amenable to integration with the agent's other mental states, and they are subject to norms of rationality that apply to intentions (Bratman 1987).

A state that is consciously inaccessible cannot serve as a tool for planning and rationally controlling action. An intention must therefore be consciously accessible. For a mental state to count as consciously accessible, it is sufficient that, at any given time (inside or outside the context of action performance), the agent may consciously access what the state represents. This means that, at the time of ϕ-ing at least, one arguably cannot have a false belief or be ignorant about the fact that one has an intention to ϕ that one is now executing (for a related but stronger claim, see Wallace 2001, p. 22; cf. Bratman 2009, pp. 38–39).

As for the integration with other mental states, motor intentions can feature as premises or conclusions in a piece of practical reasoning. For instance, I could begin with my intention to make an omelette and the belief that to make an omelette I need to have a pan, and thus come to have the intention to get the pan. I could then use the latter intention as a premise for another piece of practical reasoning, together with the belief that getting the pan requires that I grasp it. I could thus conclude that I intend to grasp the pan. This piece of practical reasoning need not be something that the agent consciously goes through as she is executing a skilled action, but she could go through it consciously if she needed to (see, e.g., Anscombe 1957, p. 80; Sutton et al. 2011).

As to norms of rationality, one that picks out intentions among other conative propositional attitudes *qua* tools for planning is Bratman's (1987) *strong consistency requirement*. According to this requirement, I can rationally hold only intentions that are consistent with the rest of my intentions and beliefs. The motivation behind this requirement is that intentions that infringe it would not lead to effective planning: if I believe that it takes at least half an hour for me to get ready, any piece of planning featuring an intention to get ready in five minutes would be doomed to failure. I may well hold an intention to get ready in five minutes while believing that I need at least half an hour, but then I would be guilty of irrationality according to the strong consistency

requirement. Motor intentions, like other intentions standardly conceived, either meet the strong consistency requirement or breach it at the cost of the subject's rationality (Brozzo 2017).

5 The standard story defended by means of motor intentions

How are motor intentions relevant to our defence of the standard story? They are relevant due to their link with motor representations. The notion of motor intention and its link with that of motor representation undermines the credibility of the idea that there is one intention that prescribes the entire instrumental structure of an activity in advance of or during action performance.

Valaris claims: "We can get the worry about subsidiary acts going by noting that even proponents of the standard story of action *allow* that the plan-content of intentions is *coarse grained*" (2015, p. 69, first emphasis is ours). But this is not sufficient: to get the worry going, it must also be assumed that these coarse-grained intentions *cannot* be supplemented by simultaneously executed intentions with finer-grained contents, at a level below our skills and habits.

The motor intention framework allows us to reject this assumption. This framework supports the idea that, at any given time, an agent simultaneously possesses a number of numerically distinct intentions with contents ranging from more determinate to more determinable. This accounts for the fact that the agent normally has non-observational knowledge of what she is doing under many different descriptions simultaneously.

We can acknowledge that conscious practical reasoning may yield intentions whose content is coarse-grained but that, whenever an agent acts on such a coarse-grained intention, she can also simultaneously be acting on more determinate/fine-grained intentions. There is a context-dependent and shifting level at which conscious practical reasoning and deliberation bottom out (which depends on the task at hand and on how much conscious access it either requires or allows), but there are sub-habitual intentional actions that are controlled by consciously accessible intentions below that level.[5]

The level of grain to which non-observational knowledge reaches will therefore normally be deeper than the level at which conscious deliberation stops. We can thus explain how agents can have non-observational knowledge of performing sub-habitual intentional actions in a way that is consistent with the standard story. Agents can have non-observational knowledge of performing subsidiary actions involved in skilled and habitual activity in virtue of those actions being represented by intentions with fine-grained contents — for example, motor intentions.

The empirical research underpinning the motor intention framework also shows that our non-observational knowledge of what we are doing is often not as detailed as Valaris seems to think. While we typically have non-observational knowledge of what we are doing, even below the level of our habits and skills, we often lack such knowledge regarding the precise trajectories of our limbs and digits.

For example, in an experiment by Fourneret and Jeannerod (1998), subjects are instructed to trace a line with a stylus on a tablet towards a certain target. Subjects know

non-observationally that they are reaching towards the target with the stylus, but they have no non-observational knowledge of the details of the trajectory that their hand is following. This is because, we would say, subjects have a motor intention to reach towards the target with the stylus, but there is just a motor representation, and no corresponding motor intention, that represents the details of the trajectory of their hand. That is, no motor intention of the subject represents this trajectory.

Analogously, while Raji has non-observational knowledge "that *she is moving her body in the way required for walking*" (Valaris 2015, p. 70), experiments such as that carried out by Fourneret and Jeannerod (1998) suggest that she does not have non-observational knowledge of the precise trajectory of her limbs.

Note that, by Valaris's own lights, details of movements that are represented by motor representations but not by matching motor intentions would not constitute intentional actions. Since the content of the motor representations is not consciously accessible to the agent, she arguably cannot have non-observational knowledge of performing what they represent and control. And recall that Valaris (2015, p. 70) assumes that non-observational knowledge of an action is necessary for it to be an intentional action.[6]

Now, Valaris argues that an appeal to motor representations — or "motor schemas" — cannot help the standard story explain how sub-habitual actions can be intentional actions. This is because he thinks it will not be possible within the standard story to distinguish between movements caused by intentions via motor representations and movements caused by intentions via representational states of other internal control systems. According to Valaris, the defender of the standard story is not entitled to claim both (i) that a particular movement of Raji's leg that is proximally caused by a motor representation is a subsidiary intentional action and (ii) that the increase in her heart rate that is proximally caused by a representational state in the cardiovascular control system is *not* such a subsidiary intentional action (where both leg movement and change in heart rate are distally caused by an intention). This is because the defender of the standard reductive story cannot claim both (i) and (ii) unless she makes use of the notion of intentional action itself. But doing this — by, for example, saying that the movement of the leg is intentional because motor representations are involved in the control of intentional action whereas states of the cardiovascular control system aren't involved in the control of intentional action — is viciously circular given the standard story's reductive ambitions.

Because of the link between motor intentions and motor representations, one might think that motor intentions will not help us defend the standard story and allow us to claim both (i) and (ii). What allows us to say that Raji doesn't have a motor intention — or a "cardiovascular intention" — to increase her heart rate? Put differently, what allows us to say that the increase in heart rate isn't a subsidiary intentional action of her walking to the kitchen?

The answer is simple. Valaris's objection rests on two premises that should be rejected. The first is that *all* motor representations are such that what they represent is consciously inaccessible to the agent: "Considerations of first-person accessibility" cannot therefore help distinguish motor representations from representational states of other internal control systems, according to Valaris (2015, p. 71). The second is that there aren't

intentions with contents as fine-grained as what is represented by motor representations (hence Valaris's construal of his objection in terms of intentions causing actions "via *motor schemas*" [ibid]).

With the notion of motor intention, we reject both these premises: motor intentions are genuine intentions with very fine-grained contents, such that what they represent matches what some motor representation represents. This means that *some* motor representations are such that what they represent *is* consciously accessible to the agent herself. And it is only these that we are appealing to. The conscious inaccessibility of what some other motor representations represent is not a problem for us since we don't make use of them to pick out subsidiary intentional actions. We can qualify some events or processes as intentional, insofar as they are caused by motor intentions, and disqualify events or processes regulated by states of other internal control systems — such as the increase in heart rate — as intentional actions, insofar as what these latter states represent is consciously inaccessible to the agent herself and, therefore, not accountable for by means of motor intentions. Our account can therefore cope with Valaris's objection, insofar as it allows for intentions whose content is as fine-grained as what is represented by motor representations. This simple solution is in line with the core commitments of the standard story.

To conclude, while Valaris's challenge to the standard story is useful and instructive, it does not reveal a fundamental flaw in the standard story as such.

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Notes

1 Some versions of the Causal Theory of Action are not reductive (see, notably, Davidson 1980a, 1980b). For a recent presentation and defence of a reductive Causal Theory of Action, see Ludwig (2016, part I).

2 Hornsby (1980) distinguishes between causally basic actions and teleologically (or intentionally) basic actions (see also Pacherie 2008, pp. 198 – 99). Here, the relevant form of basicness is teleological/intentional basicness.

3 One of us has argued that an agent's repertoire of basic actions can include some joint actions (Blomberg 2011). Within the framework presented here, this amounts to the claim that a joint bodily outcome can be represented by a motor intention of one participant while her own and the other's contributions are represented by her at most by motor representations. On motor representations and joint action, see Butterfill (2017).

4 By contrast, Pacherie (2008) takes each motor representation to have a corresponding motor intention, all the way down.

5 What matters for the intentionality of sub-habitual actions is that the motor intentions guiding them are consciously *accessible*; the agent need not actually consciously *access* them. The mere possibility of conscious access is sufficient to make these actions intentional.

6 Movements that are controlled by motor representations that are such that what they represent is consciously inacessible can arguably nevertheless *in some sense* be "expressions of intelligence", to use Valaris's (2015, p. 65) own words. A dramatic illustration of this is provided by fielders in ball sports who falsely believe that, when they catch a ball, their gaze first goes up and then goes down again as the ball they are trying to catch descends (see Reed, McLeod, and Dienes 2010). But what they actually do is raise their gaze continuously until they catch the ball. Here, the agent's false belief that she is gazing up and then down arguably defeats any non-observational knowledge that she might otherwise have had of continuously raising her gaze until catching the ball. Oddly, on Valaris's own proposed non-reductive account of intentional action, a fielder would here have to count as having non-observational knowledge that she catches a ball by raising her gaze continuously until she catches it, despite her false belief. This is because Valaris (2015, p. 78) suggests that intentional action should be thought of as "the occurrent counterparts of states of know-how". Regarding the stride that a runner named Bob takes in order to run a marathon, Valaris (2015, p. 78) writes that we should "acknowledge a way of grasping such instrumental relations that simply *consists in* ψ*-ing for the purpose of* Φ*-ing*. Bob's taking a stride […] *is* his grasping of a way for him to run a marathon". Since the way the fielder directs her gaze *is* her grasping of a way for her to catch the ball, it would arguably then also have to be something that she had non-observational knowledge of, if Valaris's account were correct. But this is clearly the wrong verdict. The fielder does not have non-observational knowledge of what she is doing under that description. Justifying how some subsidiary actions may be expressions of intelligence while at the same time being outside the scope of what is consciously accessible to the agent is not straightforward, but it is not something we need to do here to defend our standard story. Note that, if we divorce the notion of intentional action from that of non-observational knowledge, these expressions of intelligence may also, *in some sense*, be intentional.

References

Anscombe, G. E. M. *Intention*. Oxford: Basil Blackwell, 1957.

Blomberg, O. "Socially Extended Intentions-in-Action." *Review of Philosophy and Psychology* **2**.2 (2011): 335–353.

Bratman, M. E. "Two Faces of Intention." *The Philosophical Review* **93**.3 (1984): 375–405.

Bratman, M. *Intention, Plans and Practical Reason*. Cambridge, MA: Harvard University Press, 1987.

Bratman, M. E. "Intention, Belief, Practical, Theoretical," in *Spheres of Reason: New Essays in the Philosophy of Normativity*, edited by S. Robertson. Oxford: Oxford University Press, 2009, 29–61.

Brownstein, M. "Rationalizing Flow: Agency in Skilled Unreflective Action." *Philosophical Studies* **168**.2 (2014): 545–568.

Brozzo, C. "Motor Intentions: How Intentions and Motor Representations Come Together." *Mind & Language* **32**.2 (2017): 231–256.

Butterfill, S. A. "Coordinating Joint Action," in *Routledge Handbook of Collective Intentionality*, edited by M. Jankovic and K. Ludwig. Milton Park: Routledge, 2017.

Butterfill, S. A. and C. Sinigaglia. "Intention and Motor Representation in Purposive Action." *Philosophy and Phenomenological Research* **88**.1 (2014): 119–145.

Davidson, D. "Freedom to Act," in *Essays on Actions and Events*. New York: Oxford University Press, 1980a, 63–81.

Davidson, D. "Psychology as Philosophy," in *Essays on Actions and Events*. New York: Oxford University Press, 1980b, 229–239.

Enç, B. *How We Act: Causes, Reasons and Intentions*. Oxford: Oxford University Press, 2003.

Falvey, K. "Knowledge in Intention." *Philosophical Studies* **99**.1 (2000): 21–44.

Ferretti, G. "Through the Forest of Motor Representations." *Consciousness and Cognition* **43** (2016): 177–196.

Fourneret, P. and M. Jeannerod. "Limited Conscious Monitoring of Motor Performance in Normal Subjects." *Neuropsychologia* **36**.11 (1998): 1133–1140.

Hornsby, J. *Actions*. London: Routledge & Kegan Paul, 1980.

Jeannerod, M. *Motor Cognition: What Actions Tell the Self*. New York: Oxford University Press, 2006.

Ludwig, K. *From Individual to Plural Agency. Collective Action: Volume 1*. New York: Oxford University Press, 2016.

Moran, R. "Anscombe on 'Practical Knowledge'." *Philosophy* **55** (2004): 43–68.

Pacherie, E. "The Phenomenology of Action: A Conceptual Framework." *Cognition* **107**.1 (2008): 179–217.

Paul, S. K. "How We Know What We're Doing." *Philosophers' Imprint* **9**.11 (2009): 1–24.

Reed, N., P. McLeod, and Z. Dienes. "Implicit Knowledge and Motor Skill: What People Who Know How to Catch Don't Know." *Consciousness and Cognition* **19**.1 (2010): 63–76.

Searle, J. "The Intentionality of Intention and Action." *Cognitive Science* **4**.1 (1980): 47–70.

Setiya, K. "Practical Knowledge." *Ethics* **118**.3 (2008): 388–409.

Sutton, J., D. McIlwain, W. Christensen, and A. Geeves. "Applying Intelligence to the Reflexes: Embodied Skills and Habits between Dreyfus and Descartes." *Journal of the British Society for Phenomenology* **42**.1 (2011): 78–103.

Valaris, M. "The Instrumental Structure of Actions." *The Philosophical Quarterly* **65**.258 (2015): 64–83.

Velleman, D. *Practical Reflection*. Princeton: Princeton University Press, 1989.

Wallace, R. J. "Normativity, Commitment, and Instrumental Reason." *Philosophers' Imprint* **1**.3 (2001): 1–26.