



Against intellectualism about skill

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Abstract

This paper will argue that intellectualism about skill—the contention that skilled performance is without exception guided by proposition knowledge—is fundamentally flawed. It exposes that intellectualists about skill run into intractable theoretical problems in explicating a role for their novel theoretical conceit of practical modes of presentation. It then examines a proposed solution by Carlotta Pavese which seeks to identify practical modes of presentation with motor representations that guide skilled sensorimotor action. We argue that this proposed identification is problematic on empirical and theoretical grounds, and—as such—it fails to deliver on its explanatory ambitions. In the final analysis, it will be argued that intellectualism about skill is, in any case, superfluous when it comes to accounting for the aspects of skilled performance it purports to explain.

Keywords Intellectualism · Skilled performance · Habit · Propositional knowledge · Know-how

1 Introduction

One of the most impressive aspects of the skilled feats that we witness in athletic domains, such as competitive sports, is that their performers are exquisitely attuned to highly situational intricacies. Yet, an adequate explanation of how performers achieve this proves elusive. We still lack an agreed explanation of how it is that skilled performers adjust to novel, context-dependent variables so as to successfully complete their impressive endeavors. There is no existing consensus on the matter in the theoretical landscape for understanding the cognitive basis of skilled action.

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Classic cognitivist, representational-cum-computational theories of the cognitive basis of skill performance face quite general challenges—challenges which expose their shortcomings when it comes to delivering required explanatory goods (Hutto, 2013; Hutto & Myin, 2013, 2017; Robertson & Kirchhoff, 2019). Concomitantly, negative assessments of the explanatory prowess of classic cognitivist theories have been bolstered by positive developments in developing alternatives to classical cognitivist theories of the basis of intelligent skilled action (Gallagher, 2017; Kirchhoff & Robertson, 2018; Gallagher & Rucińska, 2021; Carmona, 2021; Gallagher et al., 2019).

Alternative accounts of skilled performance on the more radical end of the spectrum—based in embodied and enactive approaches to cognition—seek to de-intellectualize both the cognitive explananda and explanans. In the domain of skill performance, this has resulted in attempts to characterise the phenomena to be explained afresh and by rethinking, in this light, what is required to explain its cognitive basis. This work has led to a resurgence of interest in habits. It has been argued that habits, properly understood, are credible building blocks for explaining skill acquisition.¹ Working in concert with one another, some maintain that habits are the embodied basis of the intricate, situationally flexible routines, variously sequenced, that lie at the heart of skilled performances (Di Paolo et al., 2017; Ramírez-Vizcaya & Froese, 2019; Miyahara & Robertson, 2021; Segundo-Ortín & Heras-Escribano, 2021; Hutto & Robertson, 2020; Robertson & Kirchhoff, 2019; Ilundáin-Agurruza et al., 2018; see also Toner et al., 2022 Chapter 2).

These attempts to give habits pride of place in our explanations of skilled performance assume that habits exhibit some degree of a context-sensitive receptivity as well as resistance to modification, up to a certain point. To understand habits as having some degree of flexibility in this regard requires rejection of a familiar, negative characterization of habits (prevalent amongst cognitive scientists and philosophers alike) as entirely rigid, inflexible and automatic in nature.

Some doubt that we can call on habits, even if it is conceded that they exhibit some degree of flexibility, to tell the whole story of skilled performance. Thus, even if habits could form the ultimate foundation and basis of skill performances it is thought by many that we need something more than habitual responding to understand and explain skilled activity. To be precise, critics of this proposed type of explanation maintain that skilled performance requires on-the-fly, sensitive and controlled adjustment to aspects of the environment to which performers have not been habituated (Fridland, 2014; Papineau, 2015).

Against this theoretical backdrop, hybrid theories of skilled performance have become attractive. Accordingly, many now believe that the cognitive basis of skill performance implicates a wide mix of control mechanisms, those focused on strategic aspects of performance, which work in conjunction with automatic processes, and those that are thought to be enlisted in the implementation of those designs (e.g., Bicknell, 2021; Christensen et al., 2016).

¹ Such a view about habit as the basis of skill is consonant with a contemporary cognitive science construal of habit as “perhaps the most fundamental building block of animal learning” (Gillan et al., 2016, p. 828).

The emerging consensus in the field is that representational capacities are necessary to account for the most novel aspects of skilled performances has seen revival of the thought that some kind of representational account of cognition must be part of the full explanation of skilled performances. Such a supplement is thought necessary in order to close the explanatory gap that radical variants of enactivism (and other ‘E’ approaches)—those that eschew classical cognitivist and, in particular, representationalist explanations of skilled performance—seemingly leave vacant. It is easy to see why the fortunes of intellectualism about skill improve in light of these developments, since intellectualists about skill maintain that skilled performance is only intelligent in virtue of its being guided by agent’s propositional knowledge about a method by which to successfully act (Pavese, 2015, 2016, 2017; Stanley & Williamson, 2001, 2017).²

This paper offers a corrective. It argues that intellectualism about skill cannot be the answer to these concerns due to theoretical problems. To establish this, Section one clarifies the basic commitments of intellectualism about skill. Section two shows how intellectualist accounts of skill depend on the theoretical conceit of practical modes of presentation (or PMoPs) in their proposed explanations of context-sensitive novelty. It also rehearses standard concerns about this explanatory strategy.

Section three reviews a proposed solution, offered by Carlotta Pavese (2019). Pavese seeks to construe motor representations as PMoPs that guide skilled sensorimotor action. First, it is shown that Pavese fails to sufficiently motivate this solution by appeal to the Intentional Action argument. Second, her proposed solution is shown to be problematic on independent grounds for two reasons. First, empirically speaking, the execution of motor chunked action sequences fails to explain the diversity of actions required for skilled performance in all domains. Second, theoretically speaking, it is argued that there are positive reasons not to posit motor representations with the sort of properties they would need in order to constitute PMoPs.

In Section four, we return to address the fundamental question of whether representationalism is actually required to address the explanatory gap that arises if habits are taken to be the cognitive basis of skilled performances. We argue that there is a tenable non-representationalist alternative explanation of the capacities to respond to the context-sensitive intricacies needed to execute skilled performances that obviates the need for intellectualist accounts of skill.

2 Intellectualist commitments

Intellectualism about skill claims that skilled action is always and everywhere guided by propositional knowledge. Defenders of the view assume that a grasp of truths is a

² Intellectualism of the form these authors promote was thought by many to have been convincingly defeated by Gilbert Ryle (1945, 1949). Yet, as Santorio (2016) notes, in this regard “the orthodoxy has been reversed over the past years” (Santorio, 2016, p. 36). As Levy (2017) puts it, the “view Ryle derided as intellectualism [...] is once again a serious player in the debate” (Levy, 2017, p. 512). Indeed, since Stanley and Williamson’s seminal paper in defence of intellectualism two decades ago, its opponents have been placed very much “on the defensive” in contemporary epistemology and philosophy of mind (Levy, 2017, p. 512).

necessary ingredient of all skilled performances—it is the grasping of relevant truths that makes an action skillful.³

There are evident parallels between intellectualism about skill and intellectualism about know-how. Even though technically these are distinct proposals, they are deeply connected because intellectualists assume that skill performance always depend on know-how.⁴ Intellectualism about know-how contends that know-how is straightforwardly a kind of propositional knowledge—and they take this identification to have the advantage of being theoretically parsimonious, allowing for a “unified theory of knowledge [that] speaks against positing a further epistemic kind to account for skill and ability knowledge” (Springle & Humphreys, 2021, p. 7921).

In pressing for the latter view, Stanley and Williamson (2001, 2017) challenge what they take to be the received, Ryle-inspired view that knowing how and knowing that are distinct—a view which still has traction in much contemporary epistemology and philosophy of mind.⁵ According to the intellectualist account of know-how, in apparent head-on collision with Ryle and others, “when you learned how to swim, what happened was you learned some facts about swimming” (Stanley, 2011 p. vii).⁶ To be clear, intellectualism about know-how is the view that know-how is reducible to propositional knowledge (see Brown, 1970), and intellectualism about skill is the contention that skilled action is without exception guided by propositional knowledge.

Proponents of intellectualism make sustained efforts to assuage concerns that their position commits them to a caricatured, overly-intellectualized picture of skilled action (Pavese, 2017; Stalnaker, 2012; Stanley & Williamson, 2001). Critics of intellectualism about skill regard it as promoting an implausible, overly demanding picture of the cognitive goings-on in skilled performances. They hold intellectualism is untenably committed to construing the processes involved in bringing about skilled performances, even when sub-personal, tacit and unconscious, as necessarily reflective in character.

³ Stanley (2011) tells us, according to the intellectualist picture, “what makes an action an exercise of skill, rather than mere reflex, is the fact that it is guided by intellectual apprehension of truths” (2011, p. 174).

⁴ One might, for instance, accept that know-how is reducible to propositional knowledge (embracing intellectualism about know-how), and yet consistently allow that certain sorts of skilled action are not guided by know-how (thereby rejecting intellectualism about skill). For extended discussion of the relationship between intellectualism about skill and intellectualism about know-how, and whether these respective views might be held independently from one another, see Pavese (2016). While Pavese herself claims that skill simply is a kind of propositional knowledge, Stanley and Williamson (2017) resist such a view, construing skill instead as a special kind of disposition to know (see Riley, 2017 for an argument against such a construal).

⁵ For Ryle (1949, see also Dewey 1983/1922), a widespread—although most often tacit—adherence to intellectualism (or “The Intellectualist Legend” as he grandly termed it) amongst philosophers obscured the fact that intelligent action “itself possesses a certain *modus operandi*” (1945, p. X). Today there is still much contention remains as to whether, and the extent to which, Ryle’s assault on the Intellectualist Legend amounts to much more than the systematic dissection of a strawman (Kremer, 2017; Bennette Jackson, 2020). We agree with Natalie Waights Hickman when she claims that Ryle’s work on the relationship between know-how and skill in *The Concept of Mind* and his 1945 Proceedings of the Aristotelian Society presidential address does not obviously converge on the defense of one clear thesis.

⁶ There is an apparent conflict here because Ryle claimed that intellectualism resulted in our failing to do “justice to the distinction which is quite familiar to all of us between knowing that something is the case and knowing how to do it” (1945, p. 4). As far as he was concerned, knowing how to ϕ constituted a multitrack disposition, and its acquisition could not be reduced “to the discovery of facts” (1945, p. 4).

Focusing on know-how, Noë (2014) stresses that, for the intellectualist, it constitutes the “same type as propositional knowledge, the sort of knowledge that gets expressed in judgement” (2014, p. 5). Yet on this very basis he criticizes intellectualism on the grounds that skilled action often proceeds “in the absence of any call for, or even space for, reflection or judgement” (Noë, 2014, p. 3). Similarly, Bermúdez (2017) claims of intellectualism about skill that it is committed to the view that when “you are acting skilfully, you are reflecting, because the mental manipulation of propositions is a necessary component of control over skilled action” (2017, p. 899).

In reply, intellectualists deny that, though propositional, the know-how that informs skill requires anything like reflective judgements. Stanley (2011), for example, is at pains to emphasize that the propositional know-how that he contends guides skilled sensorimotor action is automatically instantiated and would likely be impeded if the agent engaged in anything like “contemplation or reflection” (2011, p. 173).

The above criticisms of intellectualism straightforwardly fail to hit their mark. This is because Stanley and Williamson (2017) claim that on their version intellectualism, propositional knowledge can be triggered automatically and hence it fits the profile of “the kind of knowledge that has the non-reflective character philosophers associate with knowing how” (2017, p. 714).

Indeed, Stanley (2011) takes the assumption that skilled action is guided automatically and directly by unconscious propositional knowledge to be a major theoretical advantage of their account of intellectualism about skill. For one thing, it provides a means defusing the classical Rylean contention that intellectualism falls foul of a vicious regress, since if Stanley and Williamson (2001) are to be believed, that objection ultimately turns on the notion that being guided by propositional knowledge requires contemplation (see Weatherston, 2017 and Fridland, 2013 for contemporary discussion of Ryle’s regress).⁷

Moreover, Stanley (2011) maintains that going this way provides an explanatory edge—it provides an account of skill that fits with a parsimonious explanation of the phenomena of choking under pressure. On his intellectualist analysis, an expert consciously reflecting upon her knowledge of how to act successfully will disrupt the automatic and unreflective unfolding of her action. She will, in this sense, get in her own way.⁸ For Stanley, “Only mere novices have to engage in a separate and prior

⁷ As Waights Hickman (2019)—whom, perhaps surprisingly, takes the work of Ryle to provide the resources for a plausible form of intellectualism about know-how (albeit one that relies on Hyman’s (2015) unconventional notion of propositional knowledge)—so puts it: “neo-intellectualists disclaim the two-step conception of knowledge use,” whereupon an agent must consciously consider a proposition before acting upon or being guided by it (2018, p. X). It is worth noting that *The Concept of Mind* contains the claim that “the general assertion that all intelligent performance requires to be prefaced by the consideration of appropriate propositions rings implausibly, even when it is apologetically conceded that the required consideration is often swift and may go unmarked by the agent” (1949, p. 29). Naturally, intellectualists will be reluctant to characterize their claim that reflecting on knowledge is not a requisite of acting upon it as any kind of apologetic concession. Engaging in Ryle exegesis will take us too far from our path, however, and at any rate we accept that his fiery case against the Intellectualist Legend did indeed contain several strawman arguments. As well as his famed adaption of Carol’s regress argument, Ryle also argued against construing knowledge how as knowledge that on the basis that knowledge how is apparently gradable in a way that knowledge that is not (although see Pavese, 2017 for a plausible intellectualist response).

⁸ Montero (2016; see also Toner et al., 2021), however, appeals to a wide range of empirical data as well as phenomenological considerations to argue that skilled actors—even in the midst of performance—must

intelligent act of consulting the proposition that guides their action” (2011, p. 24). His analysis of choking is thus consistent with prominent explanations of choking in cognitive science, on which skilled sensorimotor action unfolds automatically and is disrupted by the conscious consultation of explicit or declarative knowledge (cf. Masters, 1992).

In a related vein, there is another feature of intellectualism about skill that is worth highlighting. Intellectualists are emphatic that the know-how required for even the quickest and most fluid of skilled actions can be propositional even if it is not always verbally articulable, except perhaps by use of demonstratives (cf. Fodor, 1968).⁹ For example, on this analysis, an expert woodcutter might be guided in his skillfully rift saw wood by propositional knowledge about a method by which he can effectively do so, and yet—when asked for details about how he achieves this feat he may only be able to tell us “I cut it like *this*.”

Let us assume, for the sake of argument, that all of the above are in good order and that there is no fundamental problem with the intellectualist contention that the propositional knowledge that guides skilled performance is automatically triggered and instantiated. Still, intellectualists need to say how a standing propositional knowledge state can possibly account for the intelligence implicated in skilled performance. Their answer, which we will explicate, review and reject in the next two sections, is to posit so-called practical modes of presentation, henceforth PMoPs, to do the heavy theoretical lifting at this juncture.

Footnote 8 continued

often be consciously aware (indeed, often hyperaware) of the intricacies of their bodily movements (2016, Chapter 4 *et passim*). Thus, although she readily allows that *certain sorts* of reflection hinder skilled action, we should not see conscious thought at the enemy of skilled performance. In defending this view, Montero (2018) argues (*contra* Dreyfus, 2005) that grandmasters—and chess players of lesser skill—do indeed consciously deliberate during blitz games. She thus disagrees with Dreyfus that a blitz grandmaster, in cultivating her chess game to an expert level, “develops a way of coping in which reason plays no role” (2005, p. 53). We will not here evaluate Montero’s proposal, but it is worth noting that Stanley is adamant in his claim that “genuinely skilled action requires being directly guided by one’s propositional knowledge—being guided automatically and *without reflection*” (2011, p. 24 *emphasis ours*).

⁹ Bermúdez (2017) is highly sceptical that demonstratives can do the work intellectualists require of them. He cites studies undertaken by Beilock et al. (2002) where expert golfers were seemingly able to articulate highly detailed and accurate generic descriptions of the steps required for successful putting. Yet these same golfers were unable to provide detailed or accurate episodic descriptions of their own recent putts. Bermúdez (2017) contends that the burden falls on intellectualists to explain why, if expert’s can only verbally describe their own skilled feats by invoking demonstratives that they are nonetheless able to provide more general descriptions of the methods by which one might successfully complete the task they were performing in demonstrative-free terms (Bermúdez, 2017, p. 12; see Høffding and Montero, 2019 for recent philosophical discussion of expertise-induced amnesia). Brownstein and Michaelson (2016) also criticise intellectualism by citing a host of cases in which skilled agents apparently know how to ϕ but deny knowing the method by which they ϕ is in fact the way they ϕ . Stanley (2015) claims that the intellectualist can easily conceive of such cases as examples of conflict between an erroneous conscious belief of the skilled agent about the way that she performs some skilled action and the unconscious belief that actually guides said action. He claims that such an appeal to conflicting attitudes only seems unintuitive insofar as we assume an overly idealized notion of what it is to act on the basis of reasons (see Miyahara and Robertson (2021) for a detailed criticism of Stanley’s claims in this regard).

3 Intellectualism's automatic defeat

Intellectualists maintain that the grasp of propositions is the cognitive basis of skilled performance. However, it is the fine-grained way that such propositions are grasped that is the key to their proposal about how skilled performers are able to cope with the intricacies of particular situations. As such they posit PMoPs in order to explain what the grasp of fine-grained propositions involves when performing skilled actions.

Modes of presentations are familiar philosophical apparatus (Frege, 1892). They individuate the content of thoughts in a fine-grained manner, not only by appeal to what one's thoughts are about or what they refer to (its transparent, extensional content) but also by appeal to the specific way such thoughts are grasped or the guise under which they present themselves (as captured by the thought's opaque, intensional-with-an-s content). Thus, to think that (1) 'Peter Parker is Peter Parker' is not to think that (2) 'Peter Parker is Spiderman', although these thoughts have the same extension. It is easy to see from this example why introducing modes of presentation into the mix is thought necessary if we are to explain a subject's capacity to think certain thoughts. This is because how we think about a given subject matter makes a difference to the inferences we can draw about it. It is how a proposition is grasped, as captured by its intensional (with-an-s) content, and not just the unmediated having of attitudes directed at a proposition in extension that does the work in making reasoning, including practical reasoning, possible. This explains why we can expect entirely different reactions to discovering (2) as opposed to (1).

Intellectualists call upon and extend the notion of a mode of presentation when they maintain that a subject *S* knows how to Φ iff *S* has propositional knowledge of some way *w* such that *w* is a way that she can Φ (Stanley & Williamson, 2001). Thus, they hold that the knowledge required for skilled performance is a form of *de se* knowledge that is always grasped under a PMoP, or a practical mode of thinking, as Stanley (2011) is wont to say. Skilled action, on this account, always involves grasping a proposition practically.

What could it mean to grasp a proposition practically? The suggestion at hand is that in thinking about a tool, we might think about it in a specific, practical way—namely, in a way that leads to a particular use of that tool. That way of thinking about the tool can be contrasted with cases in which one is merely thinking about the tool conceptually or via a particular perceptual modality, say in a visual, auditory or tactile way—as we might when waxing theoretical about its characteristics, or simply staring at it, hearing it drop to the floor, or simply running our hand over it without any predilection to use the tool for a task. Similar reasoning motivates Pavese (2019) to distinguish between three types of modes of presentation—conceptual, perceptual and practical (see also Stanley, 2011).

Despite the fact that modes of presentation have a long history of being invoked in philosophy, serious objections have been raised about whether anything answers to such invocations (See e.g., Millikan, 2000; Stalnaker, 2012).¹⁰ And among those who might allow that positing modes of presentation is not entirely empty or bankrupt,

¹⁰ Millikan (2000), for example, argues that even linguistically-based methods of re-identification should not be understood in terms of MoPs. She writes "Opaque descriptions characterise aspects of conceptions, that is, aspects of ways of identifying substances. They do not describe ways of thinking of substances. 'Via

there are those who remain suspect about the idea that PMoPs pick out anything intelligible in particular. Capturing that sentiment, Waights Hickman (2019) tells us the latter notion is “notoriously nebulous” (p. 330). A standard objection to PMoPs in the literature is that we lack a detailed account of what it means for propositional knowledge to be unconsciously grasped or entertained, sub-personally. At least in the linguistic example presented above, which mirrors the kind of cases Frege focused on when first introducing the idea of a mode presentation, we have a clear account of how a person’s being familiar to particular names would make a difference to a subject’s inferential capacities when thinking about certain individuals. Yet, unless we help ourselves to the existence of a language of thought (or something near enough), it is unclear what could be playing the equivalent role that the names play in the Frege’s linguistic cases in a person’s mental or neural machinery?

Most seriously, Stanley and Williamson fail to specify how grasping a proposition (about how to Φ) practically can be distinguished from having the relevant practical ability to Φ . The inability to cleanly separate the idea of PMoPs from the capacities to perform the skilled action themselves has led a number of authors to claim that intellectualists “smuggle in” the idea of just the right kind of ability-entailing know-how, constitutively, into the very idea of a PMoP (Koethe, 2002; See also Glick, 2015; Dickie, 2012). This intellectualist move seems ad hoc even if it is accepted that propositions can be grasped in such a way that they entail abilities. After all, why not simply say that the relevant abilities suffice to explain the skill? Fundamentally, if the aforementioned logical separation cannot be achieved then it is unclear how PMoPs can be said to entail or explain abilities to Φ . Making this objection, Jung and Newen (2010) hit the nail on the head:

[E]ven though it is the core of their argument, Stanley and Williamson’s explanation of the practical mode of presentation remains unsatisfactory. They do not analyze what it means ‘to be related in complex ways to dispositional states’ in the case of entertaining a proposition under a practical mode of presentation. What is missing is the explanation of the cognitive phenomena *underlying* the relevant modes of presentation (Jung & Newen, 2010, p. 121, emphasis added).

Consider again Stanley and Williamson (2001) core claim about skillful performing. It is that skillful performing is a matter of grasping the relevant proposition under a particular PMoP. Yet, important, grasping said proposition practically entails being disposed to behave in the right kinds of ways (see, e.g., p. 429). And vice versa: being disposed to behave in the right ways in such cases entails one is grasping the relevant proposition practically. This emphasis on having the right kinds of disposition is explicit in Stanley (2011), when he proposes how PMoPs could, in his view, explain how skilled performers manage to deal adeptly with novel, unforeseen circumstances. He writes:

Footnote 10 continued

a definite description’ and ‘via a proper name’ are not ways of thinking of things. Nor, of course, is ‘by recognising her face’ or ‘by recognising her voice’ a way of thinking of a person” (Millikan, 2000, p. 176). Quite generally, for her “Fregean senses and their kin ... have to pretty much be trashed” (Millikan, 2000, p. 13). Stalnaker (2012) is also scathing about the conceptual clarity of the notion of a mode of presentation. He tells us: “I don’t myself have a clear enough idea what modes of presentation might be to know whether they are ontologically mysterious or not” (p. 758).

... the fact that a skilled outfielder has *de re* knowledge of a way of thinking of fielding a fly ball, and thinks of that way practically, explains why he is able to react fluidly to the occasional unusual fly ball. One can only have the right kind of propositional knowledge of a way of doing something if one's dispositional structure is sufficiently complex to accommodate novel situations. Otherwise, one merely has *de dicto* knowledge of a descriptive instruction manual. ... What we assert when we assert of a skilled outfielder that he knows how to field fly balls is that he knows all of a range of relevant ways that give him counterfactual success in fielding fly balls. Hence, to say of an outfielder in baseball that he knows how to catch a fly ball is to impart to him knowledge of many propositions of the form 'w is a way for him to field a fly ball'. For each of these propositions, knowledge of it structures his behavioral dispositions in manifold ways. Experts have knowledge of many propositions about ways of performing the same task. Each propositional knowledge state results in what Ryle would call a multi-track disposition. It is the apprehension of truths by the intellect that explains why a professional outfielder is able to adapt to field fly balls hit in novel ways, and that we are able to adapt so smoothly to novel conversational situations. (Stanley, 2011, p. 183).¹¹

In seeking to explain how skilled performers possess the capacity to adapt to situational intricacies, intellectualists assume they have knowledge of a range of fine-grained propositions about different ways to complete their endeavours. But two things are notable in addition to this. First, it cannot be that such knowledge merely entails the existence of complex dispositions. *Pace* Stanley—to be a workable account, the dispositions in question must be of precisely the right kind to achieve the skilful performance in question. Second, and herein lies a tension, it cannot be only that the right kind of knowledge and the right set of dispositions are mutually entailing if the intellectualism is to have an explanatory edge. This is because intellectualism will only be explanatory if the posited propositional knowledge, as Stanley states, in fact structures the dispositions in question.

Hence, the relationship between the knowledge and the dispositions cannot be of the purely logical, entailment variety. Yet, if that is so, then we are owed an account of how the propositional knowledge structures the relevant dispositions. What can intellectualists offer on this score?

Intellectualists, as we have seen above, claim that the appropriate task-relevant propositional knowledge automatically guides the dispositions needed to structure skilled action. This answer places serious demands upon the blind, automatic mechanisms: for they will have to, somehow, manage to select just the right propositional knowledge to thereby structure just the right set of dispositions (Fridland, 2013).

The problem is, of course, that intellectualists cannot allow that automatic mechanisms are in any way intelligent (recall, on their account, intelligence is entirely the preserve of propositional knowledge). As Carter summarises, according "to the

¹¹ Fly-ball catching is often cited by researchers as a case of skilled action that does rely on internal, action-guiding representations (Chapman, 1968; see also Robertson & Kirchoff, 2019 for a contemporary discussion of whether it does).

intellectualist view, an action counts as intelligent in virtue of being guided by propositional knowledge” (2012, p. 749). As such, far from being explanatory, it is an utter mystery how automatic mechanisms could possibly, unknowingly, select which bits of highly context-dependent, fine-grained propositional knowledge is needed to effectively structure the dispositions needed for situational skilled action to unfold (Fridland, 2013 p. 888; see also Wallis, 2008; Dreyfus, 2007).

In this light, pace intellectualist claims, it looks like we gain rather than lose, in assuming that the right set of dispositions suffices to explain the skilled performance of the outfielder. A virtue of assuming this is that it allows us to accept in principle that skilled performance might implicate cognitive processes that are automatic but also intelligent, whereas the intellectualist must claim that any automatic mechanism responsible for selecting relevant propositional knowledge is entirely devoid of intelligence.

Notice the scope and limits of our objection. We are not here claiming that propositional knowledge about how to successfully perform some task cannot be obtained in virtue of simply practicing the task. Nor are we endorsing or assuming any demanding, internalist conception of knowledge that would preclude obtaining knowledge from this sort of practice—such as one requiring non-circular reasoning to be epistemically justified (cf. Stanley, 2012). The objection is also technically neutral on the question of whether know-how is propositional or not.

In sum, making appeal to entailed propositional knowledge (grasped under a PMoP), even if we allow that such knowledge exists, does absolutely nothing to explain how the relevant dispositions arise themselves. If this is the case, then propositional knowledge seems to be straightforwardly otiose in explaining skilled action.

4 A possible intellectualist solution?

Can intellectualists address the concerns just raised? Pavese (2019) proposes to address the explanatory lacuna that haunts other versions of intellectualism about skill. As she sees it, the main problem is that intellectualists have, to date, “failed to provide an account of practical modes of presentation” (2019, p. 804).

She appeals to contemporary motor chunking theories in psychology in a bid to put empirical meat on the theoretical bones of PMoPs. She maintains that PMoPs of propositions that allegedly structure and play a guiding role in skilled action should be identified with motor representations. She aims to show that identifying PMoPs with representations that are, putatively, already posited by motor control theorists yields the requisite explanatory resources needed to save intellectualism.

In making this identification, she allows that the metaphysics of PMoPs can be understood in either one of two ways. Motor representations (aka PMoPs) might form a constitutive part of the proposition that must be grasped or motor representations (aka PMoPs) might be what enables the agent to grasp the relevant proposition. Either way, by identifying PMoPs with motor representations she seeks to establish that PMoPs are already doing important, empirically recognized, explanatory work in cognitive science. If that proves so, then—she surmises—intellectualism is saved. Does her proposal hold water?

There are at least three problems with it. The first, somewhat serious concern relates to the fact that Pavese is making a strong empirical bet about the importance of motor representations in explaining skilled action. In this regard, she is placing her bets on two specific theses: namely, that the best explanation of motor chunking involves motor representations and that motor chunking does the heavy lifting in explaining successful skill performances. Let us focus solely on the later thesis for the moment. What is its theoretical basis?

Pavese construes chunking as a process by which elementary operations in Fodor's (1968) sense of the term—operations that the motor system can perform directly but cannot perform a proper part of—become parts of more complex operational sub-sequences that are then treated as elementary operations. Chunks can be executed directly, and the motor system represents tasks in terms of these chunked action capacities. Thus, for Pavese, we can construe these motor commands as what she refers to as practical representations. Practical representations are defined as having a prescriptive, mind-to-world direction of fit in virtue of possessing imperative content. They are agent-specific, in that a particular task can be represented differently by different motor systems in terms of (or "through") the chunked action sequences that have been developed and honed by a respective motor system. Pavese identifies these prescriptive, practical representations with PMoPs. She maintains that they bear intensional-with-an-s (opaque) content in that they represent a task in terms of a particular, ability-relative method of performing it (Pavese, 2019 p. 789; see also Burge, 2009 p. 250 *et passim*).

Now, in Pavese's favour, it is true that most prominent accounts of motor sequence learning in motor control science implicate motor chunking. Sensorimotor skill acquisition is taken to involve the concatenation of subsequences of commonly co-occurring actions. For example, a particular motor sequence including six more basic actions (1-2-3-4-5-6) could be executed as a series of chunked actions (e.g. 1-2-3, 4-5, 6). It is assumed that an important advantage of motor chunking is that it substantially reduces cognitive load and thereby frees up resources for conscious deliberation (Wymbs et al., 2012; Kornysheva, 2016; Verwey et al., 2009; Lashley, 1951; Book, 1908).

Importantly, however, in making her empirical bet about the importance of motor chunking in explaining skilled action, Pavese makes much of the fact that amongst those advancing psychological theories of motor behavior, "it is widely thought that practice makes the processing of a motor sequence more efficient" (Pavese, 2019, p. 796). And here's where the trouble starts. For while it is true that it has been a prevalent assumption that chunking yields efficiency, there are a number of facets to this claim that have been brought into question. New evidence reveals that chunks do not save significant time in every domain of sensorimotor skill (see e.g., Thompson et al., 2019).

Overwhelmingly, evidence of chunks being timesaving tends to be focused on chunking acquisition in typing tasks, and we should be hesitant to generalize readily between skill domains.¹² Moreover, researchers in the field are increasingly moving away from the idea that the cultivation of skill can be explained entirely by appeal to

¹² Researchers are increasingly questioning the ecological validity of the laboratory tasks used to detect for chunks and seeking to organize experiments in this light. For instance, Bera et al. (2021) note that most chunking experiments involve the experimenter repeatedly soliciting certain movements in a way

efficient chunked sequences and the gradual replacement of non-optimal, non-chunked sequences (Ramkumar et al., 2016). Thompson et al. (2019), for example, offer data that highly skilled players of e-sport video games acquire “very few” chunks, those with high-level expertise, yet make use of a far greater repertoire of actions and continually draw a larger diversity of action sequences than their less competent counterparts.

None of this, as Thompson et al. (2019) make clear, undermines the idea that chunking plays a key role in motor-sequence inculcation. But these findings give us reason to doubt chunks are anything more than, at best, part of the story of skill development and execution.

This creates a problem for Pavese’s empirical bet since she requires that intelligence of skilled performance to be wholly accounted for in terms propositional knowledge grasped through a PMoP, the latter of which she equates with motor representations of chunked sequences as providing an explanation of the procedural component of skilled performances.

A more serious objection to Pavese’s account is that it cannot fully explain the situational novelty of skilled performance. The root problem is that representing a task in terms of the highly stereotyped, concatenated action sequences that have become chunked has no hope of explaining the vast diversity of intelligent action-responses that characterize the fluidity of skilled, expert action.

The question for Pavese is: how do chunked action sub-sequences, those that have been learned and inculcated in a system, get woven together in just the right, context-sensitive ways so as to enable the guidance of nuanced motor sequencing needed for successful expert sensorimotor performance? Such an explanation is required to account for what Bruineberg et al. (2021) have recently termed metastable attunement: the skilled performer’s capacity to simultaneously exhibit sensitivity to both the intricate peculiarities of the situation in which she performs the task in hand and also a sensitivity to the vast multiplicity of action possibilities she might engage so as to accomplish said task. Notice also that, for the reasons highlighted in the previous section, a merely automatic and unintelligent mechanism cannot be the answer.

Thus, Pavese had better have secured an explanatory role for the notion of guiding propositional knowledge if her theory is to deliver the paydirt that other intellectualists cannot. Presumably, in her account, she can explain how propositional knowledge functions—as Stanley puts it, to “structure and organize” the skilled behaviour of the performer. And yet, securing such a role for the propositions themselves to play is just what Pavese (2019) account fails to provide.

To see what is at stake here, consider Pavese’s reply to Levy’s (2017) challenge to intellectualism. Levy proposes an anti-intellectualist account of skill and a composite view of know-how. For him, motor representations are intelligent, though non-propositional, and implicated in guiding skilled sensorimotor action. If he is right about the properties of motor representations then intellectualists who appeal

Footnote 12 continued

that does not seem to match more natural cases of skilled performance. They resultantly seek to design an experimental procedure for detecting chunks that avoids this dependence. The vast majority of experimental paradigms for detecting chunking—e.g., discrete sequence production tasks—tend to be utilized for testing for reliance on chunking in keyboard typing proficiency, and yet as Thompson et al. (2019) note, since words are intuitively thought of as chunked letter sequences, “the importance of chunks is possibly exaggerated in these domains” (2019, p. 2; see also Book, 1908).

to such representations are simply wrong that only propositional knowledge guides the intelligent aspects of skilled performance.

Pavese (2019) shows that intellectualists can sidestep this objection by allowing for non-propositional motor representations to play a role in guiding skilled action if they can be identified with PMOPs. That said, Pavese (2019) leaves unexamined Levy's claim that there could be cases of skilled action in which motor representations play guiding role even though no propositional knowledge is involved. Thus Levy (2017) leaves it as an open question whether there may be "cases [of skilled action] which do not involve propositional knowledge at all" (2017, p. X).

What this shows is that there is still something missing from Pavese's account. For even if motor representations are playing the guiding role that she assigns to them, we still lack an explanation as to how they do so in virtue of the fact that they are essentially connected to the relevant propositions. Even if it is allowed that propositional knowledge of just the right kind that could explain any given skilled performance exists, and even if it allowed that motor representations exist and they explain what structures the procedural component of skilled performances, there is still a mystery about how the former could make a material difference to explaining skill performance. It would seem that, explanatorily speaking, just having the right motor representations suffices to explain skilled performances. The relevant propositional knowledge, even if it existed, seems to be an explanatory dangler—hence Pavese's proposed solutions appears to face a local version of the classic 'screening off' of 'exclusion' problem (see, e.g., Kim, 1998).

This challenge to intellectualism is made worse if, motor representations with only non-propositional content do all the structuring work in explaining skilled performances. This is a possibility that Levy (2017) shows is easy enough to imagine. Indeed, at least in some places, Pavese herself does too: for example, when she embraces the idea that the motor representations that structure the procedural components of skilled performance are non-propositional and lack accuracy-conditions (see Pavese, 2019, p. 792). Alternatively, we might imagine that whatever structures the behavior at the neural level lacks content altogether and are thus not, in the final analysis, representations after all (see, e.g., Kirchhoff & Robertson, 2018; Gallagher, 2017; Hutto & Myin, 2020).

It is crucial to realise that unless the exclusion problem is addressed, all of the possibilities just floated about the nature of motor representations have the same explanatory force: none yield any insight into how propositional knowledge could make a difference qua propositional knowledge to skilled performance.

Things would be no different even if motor representations themselves had their own truth or accuracy-conditions, which is something Pavese (2020) defends in her more recent work (2020, p. 235).¹³ Pavese claims there is an "important sense" in which motor commands can be correct or incorrect—a sense that, she claims, explains the special ways that motor systems achieve or fail to achieve agentive intentions, as per the following example:

¹³ Construing motor commands as accurate or inaccurate relative to an intention is supposed, by Pavese (2020) to yield an important explanatory dividend in explaining ideomotor apraxia (2020, p. 237; see also Pavese, 2021).

[I]f an agent wants to dance, *ceteris paribus*, the motor system will produce a motor representation that aims at the task of dancing and represents it as having certain properties. The representation is correct if it represents the task that the agent wanted to execute—i.e., when its content matches the target. (Pavese, 2020, p. 236)

On Pavese's account, in cases where things go wrong, "the motor system is not 'hooked up' to the high-level personal representation of the task command in the right way and the motor behavior ends up diverging from the request that the agent intends to execute" (2020, p. 237). However, this proposal only pushes the exclusion problem down a level—for, even if we imagine motor representations have the requisite contents we will still need an account of how their imagined contentful properties manage to make a difference, qua contentful properties, in a way that is not systematically usurped by their structural properties (for a detailed discussion of the exclusion problem with respect to motor commands, see Hutto, 2013).

In this light, there is reason to prefer less cognitively demanding or deflated explanations of how motor systems get their work done. It is enough to explain occasional divergences between intended and executed performances by allowing that motor systems are sensitive to what is intended but without supposing that need represent the contents of intentions as such. In the same vein, and in general, something can be systematically sensitive to the semantic value of a proposition or representation—to its satisfaction conditions—e.g., whether an intention or command is fulfilled successfully—without assuming that such sensitivity is itself requires an ability to represent the contents of those very states semantically.

Is there any other reason to prefer intellectualism despite the aforementioned challenges? Pavese (2019, 2020; Pavese & Beddor, 2022) proposes a master argument, call it the Intentional Action, or IA, argument, for concluding that all skilled action must be guided propositional knowledge. This conclusion follows neatly if we accept that (P1) all skilled action is intentional action, and (P2) that all intentional action is guided by propositional knowledge. If the IA works then, "both skilful and intentional action are guided by the agent's [propositional] knowledge of the means of accomplishing their aim" (Pavese & Beddor, 2022).

IA has been robustly challenged in the literature. Springle (2019), Springle and Humphreys (2021), Sheppard and Carter (forthcoming) have all recently argued against P2. In what follows, we challenge P1. Pavese and Beddor (2022) motivate accepting P1 on the grounds that thinking of skilled action as necessarily intentional helps when it comes to explaining why certain canonical examples of accidental success are not skilful. Take the oft invoked epistemological example of Archie, a skilful archer, who, in virtue of his hand slipping, shoots an arrow far wide of his intended target only to have his arrow blown, by a fluke gust of wind, directly into the target. Although Archie's shot is successful in hitting the target, Pavese and Beddor (2022) claim, it is intuitive to think that Archie's shot was unskillful because it was unintentional (2022, p. 2). And they assume Archie did not hit the target intentionally because he did so only by accident.

Of course, and as Pavese and Beddor (2022) acknowledge, it is also possible to explain the unskilled character of Archie's successful shot without appeal to the idea

that it was unintentional. It could be argued his shot was unskilled simply because he did not succeed in hitting the target in virtue of the exercise of the dispositions that constitute his skill. After all, Archie, being a skilled archer, is generally disposed to hit his target under relevantly similar conditions even if he does not succeed in doing so in every case. This dispositional explanation of why Archie's shot is unskilled makes no assumption about it being unintentional.

Pavese and Beddor (2022) argue that their explanation is superior to the dispositionalist alternative just sketched because it, but not the latter, can account for another sort of case of accidentally successful unskilled action. They ask us to consider a case—devised by Hawley (2003)—in which a smoker named Susie attempts to perturb her colleague Joe by smoking whenever he is in her proximity. Unbeknownst to Susie, Joe is not at all troubled by her smoking but he is annoyed by the way that she taps each cigarette on the pack, “unconsciously and inadvertently”, before lighting it (Pavese & Beddor, 2022). Susie thus systematically, but accidentally, succeeds in annoying Joe when exercising her plan but only because of the way she is disposed to tap her cigarettes on the case and not because of her smoking. According to Pavese & Beddor, Susie annoys Joe and does so in virtue of her exercising her disposition to do successfully so. Nevertheless, her annoying Joe is not skilled—hence, apparently breaking the link between successful exercised dispositions and skilled actions. Their explanation, in contrast, is apparently still a live option: Susie's annoying Joe can still be unskilled on the basis of its being unintentional.

Yet there is a problem with Pavese and Beddor's attempt to rule out the dispositionalist explanation using this example. For there is reason to think Susie's successful attempts to annoy Joe are unskilled quite independently of their being unintentional. Susie's tapping of cigarettes on her case is a highly reflexive and stereotyped habit. It exhibits none of the context-sensitive flexibility needed for genuine skilled action. Thus even though Susie succeeds in virtue of exercising a disposition, the disposition in question is not skilful.

By contrast, to make the example work we'd need to suppose that Susie taps her cigarettes as deliberate means to annoy Joe, say, because she reads from Joe's face that he gets particularly wound up and irritated when she does so. In this case, Susie's action exhibits the requisite context-sensitivity required for skilful action, and she is performing her action intentionally, but knowing the latter does not help us to explain what makes her action skilful.

Worse still for Pavese and Beddor (2022), there are possible counterexamples that seem to directly challenge P1—the premise that all skilled action is intentional action. Although we cannot here devote space to a thoroughgoing defence of such counterexamples, we can briefly highlight one. Consider someone who has a knack for making people feel insecure. He might have no idea that he is making them feel this way, or perhaps is, even worse, he might be trying to make them feel happy and at ease. Nonetheless, they systematically pick up on small things, across a range of contexts and individuals, that make the other feel deeply uncomfortable. This would, *prima facie*, appear to be an exemplar case of unintentional skilled action. It is hard to see,

beyond stipulating that skilled performance must always be intentional, why such a knack does not constitute a bona fide skill.¹⁴

After all, even Pavese and Beddor (2022) leave open the possibility that there is a “loose sense” in which certain non-intentional doings are skilful. In attempting to explicit in what sense non-intentional doings can be skilful Pavese and Beddor (2022) distinguish between characteristic and non-characteristic forms of skill manifestation. Characteristically, skilled actions, they claim, manifest in intentional actions. But skills can also manifest non-characteristically in non-intentional actions. Non-characteristic manifestations of skill occur when actions, although non-intentional, still “provide evidence” for the presence of a specific skill (2022, p. 4). For instance, a basketball player might, in doing something quite mundane—say, unexpectedly catching a falling object—do so in such a way calls on a skilled use of their agility and speed, honed in other contexts. It is unclear whether or not Pavese and Beddor (2022) allow that such non-characteristic skill manifestations are themselves skilful or just provide evidence of skill.

Pavese and Beddor’s proposed way of carving up intentional and non-intentional skills is metaphysically awkward. It is far more theoretically parsimonious to assume intentional and non-intentional skills qualify as skills in virtue of shared features—say, their context-sensitive dispositional profiles. Allowing that that non-intentional doings, simply and straightforwardly, can qualify as skilled, as we have suggested above, yields clear theoretical advantages.¹⁵ Metaphysically speaking, there does not seem to be a compelling reason to distinguish two types of skills, those characteristically done for specific reasons and those exercised unintentionally—even if the former are the kinds of skills that are of most interest to epistemologists and action theorists.

5 Conclusion: knowing better

We started this paper by describing how a growing skepticism that habits could explain the whole story of the cognitive basis of skilled performance has revived the fortunes of intellectualist accounts of skill. We have elsewhere argued against traditional conceptions of habit which construe them as wholly context-insensitive, unintelligent mechanisms (Hutto & Robertson, 2020). Nevertheless, we openly acknowledge that habits cannot tell the whole story of skilled performance. Although habitual responses—such as those that implicate chunked motor sequences—form a substantial part of the basis of skilled and expert performance, they cannot fully account for the intelligence needed to act skillfully in specific situations. But if habits cannot give us everything we need in this regard, then what else needs to be added to the mix?

¹⁴ Even if one is unpersuaded, there are other cases in the skilled performance literature where our doings seem unintentional and yet highly context-sensitive and appropriate. During the final paper of the Dreyfus-McDowell debate, for example, McDowell (2013) argues that second nature activities such as unreflectively standing an appropriate distance from someone can often constitute a non-intentional yet highly context-sensitive doing (even if he does not take such doings to occupy the space of reasons) (p. 51).

¹⁵ Take Silver’s (2019) example of proficiently but unintentionally twirling a pen (2019, p. 2; see also Hutto and Robertson, 2020 for discussion).

The preceding analyses show that it is forlorn to pin any explanatory hopes on intellectualism. As formulated, intellectualism simply cannot close the explanatory gap. Moreover, ironically, if anything it threatens—as we have seen above—to push in the direction of trying to explain skilled performance by appeal to automatized and highly stereotyped response mechanisms. That is doubly ironic because the reason so many are skeptical about habits doing this work is that they are precisely thought of as automatic mechanisms that cannot exhibit the sort of intelligence required to account for the situated novelty and context-receptivity of fluid skilled performance. So, assuming intellectualism cannot account for the intelligent dimension of skilled performance, where does this leave us?

The real problem of the explanatory gap is that we need to account for the flexible, context-sensitive responsiveness to specific circumstances that cannot be explained by appeal to automatic mechanisms. We maintain that, rather than turning to intellectualism, the better answer is to accept that skilled performers, not only draw on their developed habits but adjust their responses by being sensitive to relevant information that is available *in situ*.

In saying this, we are not falling into the trap of endorsing standard information-processing stories of cognition—those that assume the relevant information is stored inside of cognizers and represented by them or their brains. That is the kind of story one might be tempted to tell if inspired by Stalnaker's (2012) attempt to put intellectualism on a more properly explanatory footing. He attempts this by advancing the view that “propositional knowledge is the possession of information and the capacity to use that information to guide one's actions” (2012, p. 755). Accordingly, when knowing-how is exercised in skilled performances, skilled performers possess information and access it in guiding their actions. Yet, so long as we operate with a scientifically respectable notion of information-as-covariance then, technically speaking, we have no account of how cognizers or their brains actually possess and use information (see Hutto & Myin, 2013, 2017). Information, understood as covariance, is not something that can be picked up, stored and used to guide action in the way Stalnaker (2012) proposes. Part of the problem here is that we also lack a naturalistically tenable account of how brains could represent such information.

Luckily, despite all of this, it is perfectly coherent to think that skill performers can be sensitive and responsive to information in their environment without picking it up or representing it at all. As such, it is possible to give an account of the flexibility of aspects of embodied skilled performance—precisely those that cannot be explained by appeal to habits—in terms of skilled performers being sensitive and responsive, in contentless ways, to structures that carry environmental information.

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