

Know-How and Skillful Action: A Rule-Free Account of Guidance

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Abstract

One can view know-how as a kind of ability; one can also view it as an underlying cognitive state that explains ability. A virtue of this latter approach is that it honors the now widely accepted anti-behaviorist idea that folk psychological concepts like knowledge and belief explain abilities and dispositions rather than reducing to them. A tempting way to develop a cognitivist account of know-how treats knowledge how to ϕ as grasp of a general purpose *rule* for ϕ ing; indeed one might think that there is no other option. I propose a cognitivist account of know-how that eschews rules, and show how it casts new light on the phenomenology of skillful action and practical modes of presentation.

1 Cognitivism About Know-How

A woodworker braces the handle of her cutting tool firmly against the base of her left thumb. By carefully guiding the tool through a pivot around her left index finger, she carves away the last bit of wood separating her project from completion. The woodworker's precise execution of the cut displays her *ability* to use the tool. It also displays her *knowledge how* to use the tool. What is the relationship between her ability and her know-how?

Neo-Ryleans about know-how take the relationship to be one of identity or constitution. For them, knowledge how to ϕ just is the ability, capacity, or disposition to ϕ .¹ In effect, neo-Ryleans subscribe to a form of *behaviorism* about know-how. And one can see how such a view might survive the otherwise wholesale repudiation of behaviorism in the philosophy of mind. An influential objection to behaviorist analyses of mental states like knowing that it's raining was the observation that such states lack a fund of behavioral dispositions to call their own (see, e.g., Grice 1974: §1). Replace a subject's desire to stay dry with a desire to be wet and the behavioral upshot of

¹Ryle's own views on know-how are presented in his (1945) and (1949). Recent defenses of neo-Rylean views include Noë (2005), Glick (2012), and Setiya (2009, 2012).

her knowledge that it's raining undergoes a reversal. But the dispositions characteristic of know-how do not seem to display such sensitivity to background psychology. Twiddle a subject's beliefs and desires all you like; the paradigmatic manifestation of her knowledge how to ϕ will remain the more or less successful performance of ϕ .²

Opposed to the neo-Rylean conception of know-how is the *cognitivist* conception. Cognitivists can grant that knowing how to ϕ , unlike knowing that it's raining, typically comes along with a proprietary fund of behavioral dispositions. But they insist that our concept of know-how is a concept of an underlying cognitive state that *explains* these dispositions, rather than something constituted by them. Although our folk psychology of this explanatory relation is perhaps not as rich and explicit as belief-desire psychology, we do speak of a subject *drawing on* her know-how in performing an action, or an action's being *guided* by the subject's knowledge how to perform it. Such ways of speaking suggest a conception of know-how as a standing mental state poised to make a distinctive functional contribution to the etiology of intelligent action.

In this paper I am interested in the prospects for developing a robustly cognitivist account of know-how. Such an account would respect three anti-behaviorist conditions on cognitive states generally. First, a cognitive state *explains the abilities associated with it* by guiding the behavior that manifests those abilities. Second, a cognitive state consists in an *intentional* or *semantic* relation between a subject and an appropriate entity. And third, a cognitive state is such that the first and second conditions stand in the right sort of explanatory relation: that a cognitive state involves an intentional relation to an appropriate entity *explains how* that state guides action.³ To encapsulate these three ideas in a slogan: A cognitive state *explains action in virtue of content*.

To apply these tenets of cognitivism to know-how, we need a sense for the sort of thing that states of know-how take as their contents. The syntactic structure of sentences of the form 'S knows how to ϕ ' suggests a cognitive relation between a subject and whatever is denoted by the

²I assume throughout that we are dealing with a *distinctively practical* kind of knowledge how to ϕ . As Jonathan Schaffer (2007: 396) notes, one in some sense comes to know how to play the flute upon hearing the Monty Python explanation, "Well, you blow in one end and move your fingers up and down the outside." But in another perfectly good sense such an explanation does not by itself transmit flute-playing know-how. The kind of know-how not transmitted is the kind I am interested in. See Pavese (2015: fn. 2). See also Glick (2012) and Fridland (2015).

³To motivate this third condition note that belief, cognitive state par excellence, isn't just a state that guides action and, as it happens, also consists in a relation to a proposition. The fact that belief guides action in the way it does—via interaction with desires, intentions, other beliefs etc.—is *only intelligible* on the assumption that belief involves a relation to a certain proposition. See Stich (1983: Ch. 2), Dretske (1988, 1989) for helpful discussions of this point.

phrase 'how to ϕ '.⁴ So-called *intellectualists* take 'how to ϕ ' to denote a *proposition* about a way of ϕ ing, thus making know-how a form of propositional knowledge. *Objectualists*, in contrast, take the phrase simply to denote a way of ϕ ing—making know-how a kind of objectual knowledge, like knowing Jane or knowing Paris.⁵

Intellectualists and objectualists agree that know-how involves some sort of cognitive relation to a way of ϕ ing.⁶ So a neutral way of applying the three cognitivist ideas above to knowing-how generates the three tenets of what I will call *cognitivism about know-how*: First, knowledge how to ϕ consists in a cognitive relation between a subject and a way of ϕ ing. Second, knowledge how to ϕ explains the ability to ϕ by guiding performances of ϕ . And third, the fact that know-how consists in a cognitive relation to a way *explains how* know-how guides action in the way that it does.

These three ideas set the target of for a cognitivist account of know-how. In particular, they suggest that such an account should answer the following questions, to which we will be returning throughout the paper:

(Q1) What is a way of ϕ ing?

(Q2) What is the psychological upshot of being cognitively related to a way of ϕ ing?

(Q3) How does that upshot explain how know-how guides action?

As we will see in the next section, a natural strategy for answering these questions treats knowledge how to ϕ as involving grasp of a general-purpose *set of rules* for ϕ ing. As several philosophers have observed, such an approach fails to capture *what it's like* to draw on our know-how during spontaneous and unreflective skillful activity. But since positing rule-following can look like the only way of vindicating cognitivism about know-how, one might think that we must either abandon cognitivism or give up hope for an account of know-how that illuminates our pre-theoretic experience of the phenomenon.

⁴See Stanley (2011a: Ch. 2) for linguistic details.

⁵ See Stanley and Williamson (2001), Snowdon (2003), Stanley (2011a,b), Brogaard (2009, 2011), and Pavese (2015) for defenses of intellectualism. See Bengson and Moffett (2007, 2011) for defenses of objectualism ('non-propositional intellectualism', in their terminology).

⁶Intellectualists take knowledge how to ϕ to involve, in the first instance, a relation to a *proposition*. However, existing intellectualist views treat the relevant proposition as a structured entity, of which a way of ϕ ing is a part. Moreover, they require that the way be grasped under a 'practical mode of presentation', a condition which plays a crucial role in accounting for the action-guiding power of the relevant propositional knowledge. Since I am interested in this action-guiding power, treating ways of ϕ ing (rather than propositions) as the theoretically important object of knowing how will not lead us astray.

In this essay I hope to show that this dilemma is a false one. There is a hitherto overlooked strategy for answering Questions 1-3 while avoiding rule-following. After developing this approach in Sections 3-5, I will explain how it sheds light on the phenomenology of skillful action (§6). Before closing, I show how the account opens up a new strategy for explaining the notion of a ‘practical mode of presentation’, a controversial but crucial component of intellectualist theories of know-how (§7).

2 Know-How as Grasp of Rules

What kind of cognitive achievement is involved in coming to know how to ϕ ? According to one tempting thought, a subject who knows how to ϕ grasps a *means* to ϕ ing—a sequence of actions such that the subject could ϕ by performing those actions in that order.⁷ The cognitive upshot of grasping a means thus construed is the ability to determine *what to do next* as one is ϕ ing, an ability which contributes in an obvious way to the successful performance of ϕ .

This account is simple and intuitive, but it will not do. A person who genuinely knows how to ϕ is capable of *flexibly adapting* her ϕ ing to a wide variety of circumstances, and such adaptation will require variation in the means taken. While cycling to school Tuesday morning I swerve around a pothole that wasn’t there the day before. So I perform at least one action that I didn’t perform on Monday. Yet intuitively I am guided by the *very same* state of knowledge how to ride a bicycle on both days. So no single sequence of actions can fully capture the content of that know-how.^{8,9}

The problem suggests that we should identify know-how not with a single means but with something that *generates* means as required in different contexts of performance. What we seem to be after is some sort of general purpose *rule* that, when applied to one’s moment-to-moment situation, determines a way to go on. Just as following the arithmetical rule for converting feet to

⁷See Bengson and Moffett (2011: 191) for this characterization of a way of ϕ ing. Setiya (2008) also glosses intellectualism as positing knowledge of means.

⁸Hornsby (2011: 93) makes a similar point.

⁹One might suggest that, described in terms of ‘higher-level’ actions like pedaling and balancing, the means I took to riding to school were the same on both days. But notice that these higher level actions themselves require substantive know-how to perform: part of what I learn when I learn how to ride a bike is how to pedal and how to balance. So a means couched in terms of such actions cannot exhaustively characterize my know-how. Within the means-based framework, an exhaustive characterization must have to invoke means that include only actions which themselves require no further means—viz. basic actions.

meters will lead one to perform different computations depending on the particular measurement being converted, following a rule for an activity can guide one in performing different actions depending on relevant features of the situation.¹⁰

We have on the table an account of know-how that answers Q1-Q3 from Section 1 as follows:

(A1) A way of ϕ ing is a *rule* (or set of rules) for ϕ ing.

(A2) The cognitive upshot of grasping a rule is the ability to *apply* that rule.

(A3) Applying the rule guides the subject's ϕ ing by enabling her to determine what action to execute a given moment during her performance.

Let us call these three ideas taken together the *rule-based account* of know-how.

Now, Gilbert Ryle (1949) famously observed that many skillful activities don't seem to involve the consultation of rules ('regulative propositions', in his terminology). Although I may mentally rehearse instructions while performing activities in which I am not yet fluent, when I engage in activities I know well how to perform—walking across the room or lifting a glass to my lips—I don't need to think at all about what to do. Instead I just do it.

The friend of the rule-based account will react predictably to this observation. Although it may not *seem* to us like we are consulting rules as we spontaneously adjust our balance on a bicycle or step over an obstacle while walking, this is just another case where naïve introspection misleads. As fluency increases, the once conscious consultation of rules gets outsourced to some subpersonal widget. Internalized rules remain the intelligent basis of skillful action.

Hubert Dreyfus has long been arguing that there is something deeply unattractive about the maneuver of trying to save rule-following by relegating it to the unconscious. Here is a representative passage:

While infants acquire skills by imitation and trial and error, in our formal instruction we start with rules. The rules, however, seem to give way to more flexible responses as we become skilled. We should therefore be suspicious of the cognitivist assumption that, as we become experts, our rules become unconscious. Indeed, our experience suggests that rules are like training wheels. We may need such aids when learning to ride a bicycle, but we must eventually set them aside if we are to become skilled cyclists. To assume that the rules we once consciously followed become unconscious is like assuming that, when we finally learn to ride a bike, the training wheels that were required for us to be able to ride in the first place must have become invisible. The actual phenomenon suggests that to become experts we must switch from detached rule-following to a more involved and situation-specific way of coping. (2005: 7)

¹⁰Pavese (2015) develops an account of this kind, on which knowledge how to ϕ involves grasp of an inferential rule which implements an algorithm for ϕ ing.

Now one can imagine the following sort of response to Dreyfus' complaint. Cognitivism about know-how is plausible for the same sorts of anti-behaviorist reasons that recommend cognitivism about uncontroversially cognitive mental states like belief. But if knowledge how to ϕ consists in grasp of a way of ϕ ing, the only idea of a way of ϕ ing we have such that grasp of it *stands a chance* at explaining the flexible and versatile ability to ϕ is something like a *rule* for ϕ ing. If we want to be cognitivists, the rule-based account can seem to be *the only game in town*.¹¹

On the assumption that the rule-based account *really is* the only game in town, cognitivism must conflict with what "the actual phenomenon [of skillful action] suggests." But, as I hope to show, this assumption is false: the region of logical space carved out by the doctrine of cognitivism leaves room for a philosophically motivated account of know-how and its action-guiding role that involves no appeal to rules.

I will lay out this account in three stages, each addressing one of the questions identified in Section 1. My answer to Question 1 (What is a way of ϕ ing?) grows out of H. H. Price's thought that intelligent action flows from grasp of a practical universal:

Sometimes...familiarity with a universal enables...an actual real-life instance. If you are up in an aeroplane and ask the pilot what a stall is, he may answer by pulling back the control stick and actually doing one. His familiarity with that universal has enabled him to produce an actual instance of it.¹² (1946: 36)

Instead of practical universals I will speak of practical *kinds*. I will propose to identify ways of ϕ ing with *natural parts* of the practical kind ϕ . Since practical kinds (I will argue) determine normative standards for performances, grasping a way of ϕ ing involves grasp of the features of performances that determine how well they meet those standards (§3.) To answer Question 2 (What is the upshot of being cognitive related to a way of ϕ ing?), I suggest that grasp of these normative features endows a subject with the capacity to *perceptually recognize* them as instantiated by her own ϕ ing activity (§4). In response to Question 3 (How do these perceptual capacities enable the guidance of skilled action?) I say: by interacting in a certain way with the subject's *guiding intention* as she carries out her activity (§5).

As this brief survey makes clear, the account to come combines several quite substantive ideas. Rather than attempting a thoroughgoing defense of each of them independently, I have instead

¹¹Compare Fodor (1975).

¹²Price's own answer to Questions (2) and (3) was less informative than we might hope for: "Our familiarity with the universal, a cognitive state, overflows of itself into an activity which is practical."

chosen to keep my exposition as brief and simple as possible. I hope that this approach will allow the organic unity of the account to emerge more clearly, as well as to make its applications in Sections 6 and 7 easier to understand.

3 Practical Kinds and their Normative Structure

A cognitivist account of know-how needs a conception of a *way of ϕ ing*. Ordinary language countenances many different fillings of the blank in the sentence, ‘_____ was the way S ϕ ed’—as it might be, ‘quickly’, ‘with a gun’, or ‘by cutting the yellow wire’. Not all these fillings denote entities such that grasp of them could reasonably constitute a subject’s knowledge how to ϕ . Surely the way of doing things denoted by the adverb ‘quickly’ is not the sort of thing grasp of which could form the cognitive core of, for example, the ability to *ride a bicycle* quickly.

We need a notion of a way of ϕ ing that bears a tighter relation to the action ϕ than *quickly* does to the action of riding a bike. To obtain such a notion, treat the characterizing phrase ‘of ϕ ing’ in the expression ‘way of ϕ ing’ as specifying the *essence* of the way. Bicycle-riding is merely incidental to the way of doing things denoted by ‘quickly’; if *quickly* is a way of riding a bike, it is so non-essentially. In contrast, the way of making a fist which consists in moving my fingers thus and so is *essentially* a way of making a fist: I could not realize that way without realizing an act of fist-making.

Following Stanley and Williamson (2001: 427), think of ways of ϕ ing as properties of token events: some events instantiate the property of realizing a particular kind of performance of ϕ . Similarly, think of the action-kind ϕ as the property borne by all and only (metaphysically possible) events that realize a performance of ϕ . Then the present notion of way of ϕ ing is the notion of a *determinate* of the property corresponding to action ϕ .

Call this latter property the *practical kind* for action ϕ . If ways of ϕ ing are determinates of practical kinds, we might expect ways of ϕ ing to inherit certain structural features from their practical kinds. These features will play a key role in my answers to Questions (2) and (3). First I’ll explain those features in the case of practical kinds (§§3.1-3.3), then I’ll explain how ways of ϕ ing inherit them (§3.4).

3.1 Practical kinds as goodness-fixing kinds

The account to come rests on the idea that practical kinds have an *intrinsic normative structure*, which can be characterized in terms of certain *dynamical properties* exhibited by the members of the kind.

Let's begin with the idea that practical kinds have an intrinsic normative structure. Judith Jarvis Thomson (2008: Ch. 1) observes that many kinds are *goodness-fixing kinds*. A goodness-fixing kind is a kind K such that "what being a K is itself sets the standards that a K has to meet if it is to be good *qua* K." (21) The kind *house* is a goodness-fixing kind. Part of what it is to be a house is to provide shelter from the elements. And to be good *qua* house is, inter alia, to provide good shelter from the elements.¹³

Thomson goes on to claim that "there is a property of being good *qua* K only if K is a goodness-fixing kind." If she is right about this, then practical kinds—kinds that subsume performances of actions—are goodness-fixing kinds. Consider a token performance of ϕ . We might evaluate that performance along different dimensions—the amount of happiness it caused, whether the performance was the upshot of a rational decision, etc. But we can also evaluate the performance simply as a performance of ϕ . It is after all commonplace to evaluate an activity for *how well it was done*. This dimension of evaluation can be invoked even if the action was deficient in other ways (by being non-optimific or irrational). To ask whether an action was done well or badly is to invoke a standard of evaluation that is internal to the action itself. It is to evaluate the action *qua* performance of ϕ .¹⁴

In contrast with more enigmatic notions of goodness such as Moorean non-natural goodness, the goodness associated with a goodness-fixing kind is relatively unmysterious.¹⁵ That is because it is usually pretty clear how to begin to characterize the standards of goodness for a goodness-fixing kind K in terms that don't refer to the goodness of Ks *qua* Ks.¹⁶

¹³Thomson mentions *seeing eye dog, tennis player, beefsteak tomato, tiger, and human being* as further examples of goodness-fixing kinds.

¹⁴The notion of a goodness-fixing kind is in effect Christine Korsgaard's (1996; 2008) notion of a kind with *constitutive standards*—"standards that apply to a thing simply in virtue of its being the kind of thing that it is." (Korsgaard, 2008: 28).

¹⁵Or at any rate no *more* mysterious than the goodness-fixing kind itself.

¹⁶I hereafter drop the qualification '*qua* Ks'; all references to goodness should be understood as references to the goodness *qua* K for the relevant K. Similarly references to any kind of normativity are references to the normativity associated with the goodness of a (contextually relevant) goodness-fixing kind.

Take Thomson's example of the kind *toaster*. We know that *toaster* is a goodness-fixing kind because it makes perfect sense to ask how good a toaster is *qua* toaster. But what are we evaluating the toaster *for* when we evaluate its goodness *qua* toaster? There is no deep mystery here. We are evaluating the toaster for something like the degree to which it is disposed to transform untoasted bread into toasted bread in conformity with the user-specified degree of toasting. If the toaster produces moderately toasted bread when the dial is set to medium and darkly toasted bread when the dial is set to dark, the toaster is doing well with respect to the standards of goodness fixed by the kind *toaster*. In this way, those standards can be explained in terms of certain *properties* of the toaster—in this case toasting-dispositional properties—that can be characterized without reference to the goodness of toasters.

What goes for toasters goes for performances of actions. When we evaluate a bicycle ride for its goodness *qua* bicycle ride—for *how well* the bicycle was ridden on that occasion—we attend to certain properties of the ride. If the bicycle was wobbling all over the place, or if the rider was trying futilely to accelerate by pedaling furiously on the lowest gear, we will view the ride as deficient, as carried out poorly. And as with toasters, when we evaluate performances of actions, we are not glomming on to some mysterious further facts about the performance that float free of, or bear an obscure relation to, the ordinary constitutive properties of the activity; rather, it is those very properties we have in mind.¹⁷ So if we want to characterize the normative structure of a practical kind, we will need a characterization the properties targeted by evaluations of performances of the action. The task of the next subsection is to propose such a characterization.

3.2 Normatively privileged trajectory properties

Performances of actions are temporally extended events. The goodness of a given performance will consist in certain aspects of the world being changed in certain ways over time. A good performance of the front crawl, for example, involves certain patterns of ongoing change in the position of the swimmer's arms and legs.

To construct a scheme for representing these patterns of change, let us begin with the idea of a *dynamical variable*. A dynamical variable describes a single respect in which the state of a

¹⁷There might of course be metaphysical mysteries about how those properties got to be the ones that mattered for the goodness of the kind. But this observation need not suggest that the properties themselves are metaphysically problematic.

system may change over time. In the case of bicycle riding, a dynamical variable might describe the orientation of the bicycle, or its speed, or the amount of pressure applied to one of the pedals. In the case of swimming the front crawl, a dynamical variable might describe the angle of the swimmer's right elbow.

Now notice that some dynamical variables matter to how well the activity is performed in a way that others don't. Contrast the dynamical variable that describes the vertical orientation of a bicycle and the variable that describes the configuration of the cyclist's hair. Both variables evolve over the course of a bicycle ride. But the evolution of the first variable matters to assessment of how well the activity is performed in a way that the second doesn't. Some dynamical variables, then, are *normatively privileged*, where a dynamical variable is normatively privileged if it is such that evolution of the feature of the activity it describes matters for how well the activity is performed.

With the notion of a normatively privileged dynamical variable in hand, we can construct an abstract representation of the sorts of properties that normative assessment of a performance targets. Take the collection of all the normatively privileged dynamical variables,¹⁸ and set up a mathematical space with an axis corresponding to each of them and an axis for time. We can then represent the properties we are interested in as *trajectories* through this space. Let us call such a space an *activity space*, or a ϕ -*space* when we are talking about the performance of action ϕ .

Each activity space trajectory can be viewed as specifying an equivalence class within the modal extension of the practical kind in question, under the equivalence relation *identical in respect of temporal evolution of the normatively privileged dynamical variables*.¹⁹ More intuitively, an activity space trajectory captures a certain diachronic structural property that is shared by all and only performances of the action in question that are *normatively equivalent*, in the sense that those performances unfold identically with respect to features that matter for normative evaluation of performances of the activity.²⁰ Since these properties are represented by trajectories through activity space, let us call them *trajectory-properties*.

¹⁸The variables should be non-redundant, though not necessarily orthogonal in the mathematical sense.

¹⁹An equivalence relation R is a binary relation that's reflexive (everything bears R to itself), symmetric (if x bears R to y , then y bears R to x), and transitive (if x bears R to y and y bears it to z , then x bears R to z). An *equivalence class* relative to relation R is a maximal set each member of which bears R to every other member.

²⁰Note that this is a stronger kind of normative equivalence than the equivalence relation denoted by the phrase 'just as good as'. Bicycle ride A can be just as good as bicycle ride B, but the two rides can be good in different ways—i.e. with respect to evolution of distinct normatively privileged dynamical variables.

Trajectory-properties are the performance-of- ϕ analogues of the toasting-dispositional properties that we target when we subject a toaster to normative evaluation *qua* toaster. Just as we attend to the degree to which a toaster is disposed to toast bread in conformity with the way it is set, we attend to the patterns of evolution of certain features of an activity when we assess it for how well it was brought off. In modeling these patterns of evolution, then, we are (partly) modeling the internal normative structure of the activity in question.

3.3 Normative rankings

Our goal in this section has been to represent the normative structure of a practical kind. We started out with the practical kind ϕ , which we can think of (in a Lewisian fashion²¹) as the set of metaphysically possible performances of ϕ . The first piece of structure we added was a carving of that set into trajectory-properties, which we represented by trajectories through ϕ -space.

The need for a second piece of structure becomes clear when we remind ourselves that normative distinctions in general don't just carve the world into categories; they also *rank* those categories along a normative dimension. To capture the full normative structure of a practical kind, then, a mere partitioning of the kind's members is insufficient; the cells of that partition must be ranked so as to reflect differences between the cells in respect of how well the performances subsumed by each meet the standards of goodness for the practical kind.

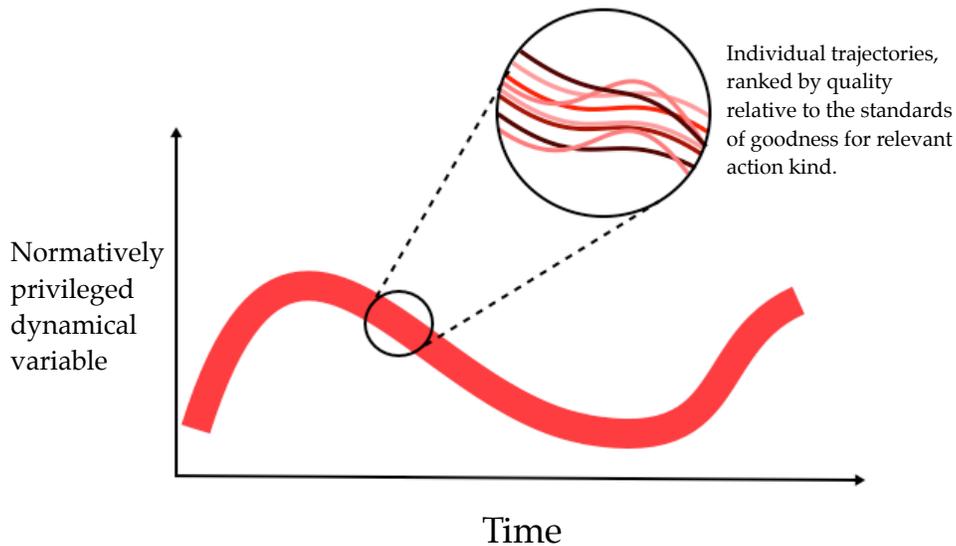
The most conservative way to represent this ranking is by means of a pre-ordering. A pre-ordering ranks members of a set with respect to some other members of that set—but not necessarily with respect to all of them, and in a way that allows for ties between distinct members.²² This allows for the possibility that certain members of the set cannot be evaluatively compared to certain other members of the set. We cannot rule out this possibility for the trajectory-properties subsumed by a practical kind. Consider a trajectory through bicycle-riding space that represents performances of bicycle riding that wobble in a certain way. Now consider a trajectory through that same space that represents performances of bicycle riding that involve a certain slight misuse of the gears. Perhaps there is no single evaluative scale along which wobbling can be compared to gear misuse. In that case, we will want a representation of evaluative structure that doesn't

²¹Lewis (1986).

²²A pre-ordering is a relation R that is reflexive (everything bears R to itself) and transitive (if x bears R to y and y bears it to z , then x bears R to z).

require these two trajectories to be ranked relative to one another.

We are now in a position to represent a practical kind in a way that makes explicit its normative structure in terms of the trajectory-properties borne by its members. The trajectory-properties are represented by trajectories through activity space, and the normative relationships between those properties are represented by a pre-ordering on the trajectories. We can thus represent a practical kind visually in the figure below.



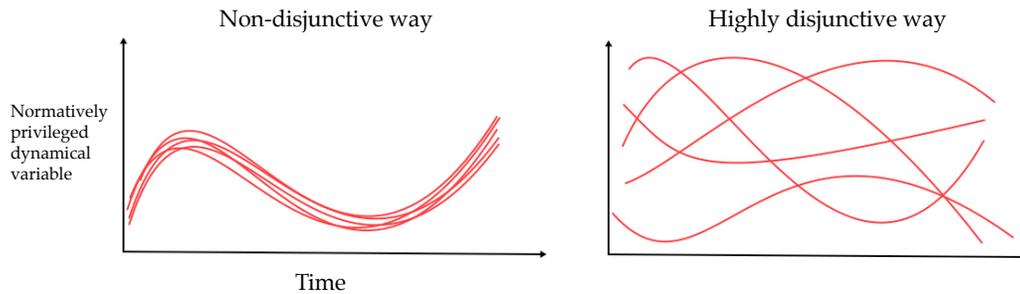
The thick curve represents a bundle of trajectories through activity space. The vertical axis describes one of the normatively privileged dynamical variables (e.g. vertical bicycle orientation). The horizontal axis represents time. The shading represents normative ordering facts about the trajectories: the darker the trajectory, the higher it ranks relative to the normative standards for the relevant activity.

3.4 Back to ways

This section so far has developed a scheme for representing the normative structure of practical kinds. But what we are ultimately after is the notion of a *way* of ϕ ing. We can characterize ways in terms of practical kinds.

To proceed, let us again adopt our Lewisian idiom in which properties are identified with their modal extensions. The proposal, then, is to think of a way of ϕ ing as a subclass of the modal extension of the practical kind ϕ that is *relatively natural* in at least two respects. First, the class should cut along the joints determined by the trajectory-properties. That is, it should not be such that it includes some performances of ϕ but excludes other performances that are identical with

respect to evolution of the normatively privileged dynamical variables. And second, the class should not be too disjunctive. The idea here is that the class should be representable by a roughly contiguous *bundle* of trajectories through activity space, not a bunch of trajectories that crisscross the space in a chaotic fashion. The figure below illustrates this contrast.



In these two respects, the notion of a way of ϕ ing I am after is analogous to the notion of a way of being red. If a way of being red is thought of as a subset of the modal extension of the kind *red*, it should not distinguish between objects that have the same fully determinate color properties. And a way of being red should not include a gerrymandered set of instances, some scarlet, some pink, some purplish. A way of being red should coincide with some continuous range of determinate color properties within the region of chromatic similarity space encompassed by the color kind *red*.

4 Cognitive Upshot

The last section proposed an answer to Question (1) from the first section: What is a way of ϕ ing? This section will address Question (2): What is the psychological upshot of grasping a way of ϕ ing? In light of the conception of ways outlined in the previous section we can rephrase the question thus: What is the psychological upshot of grasping (a part of) the normative structure of the practical kind ϕ ?

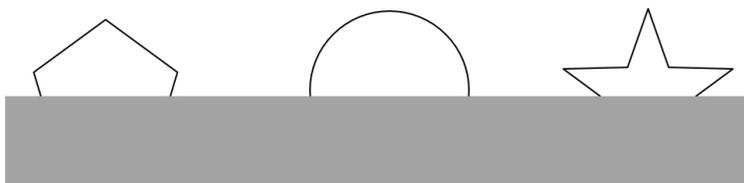
There are two aspects to the normative structure of a practical kind. First, there are the trajectory-properties, which carve up the kind into subclasses of normatively equivalent performances. And second, there are the normative relations between these subclasses, which determine how they rank against one another relative to the standards of goodness fixed by the practical kind. Fully grasping a way of ϕ ing involves grasp of both aspects. In this section I want to sug-

gest that grasp of each can endow a subject with a certain kind of perceptual capacity. The exercise of these capacities will play a crucial role in my account of how know-how guides skilled activity, which is the business of the next section.

4.1 Grasp of trajectory-properties

To grasp a way of ϕ ing is in part to grasp the trajectory-properties that it subsumes.²³ With what capacities does grasp of a property endow a subject? The account of guidance that I will go on to develop depends on the thought that the grasp of a property can manifest itself in the capacity to *perceptually recognize* instances of the property.²⁴ In virtue of such recognitional capacities, a monkey can be said to grasp the property of being a banana, or an infant the property of being his mother—even if these creatures lack *concepts* corresponding to those properties.

Recognitional capacities can operate even when the property being recognized is, in an intuitive sense, not in full view. For example, your grasp of certain shape properties manifests itself when you recognize the partially occluded figures below.



The kind of recognition involved in this example—identifying properties based on impoverished or partial perceptual access to those properties—will play a crucial role in my account of guidance, so let us give it a name. The name I propose is *extrapolative recognition*, ‘extrapolative’ because identification of properties under these conditions involves extrapolating beyond the perceptually available part of the property.

²³In this section and the next I am going to characterize a *full* grasp of a way of ϕ ing, which involves a grasp of *all* trajectory-properties subsumed by that way. This represents an idealization, since subjects will in general lack the discriminatory capacities to distinguish between highly similar trajectory-properties. The idealized model can be applied to ordinary subjects by positing *partial* grasp of a way, which entails the ability to distinguish between some but not all trajectory-properties. This issue is closely connected the gradability of know-how attributions, a connection that I explore in more detail in my thesis.

²⁴This idea is closely related to the notion of a recognitional concept, introduced to the contemporary philosophical literature by Evans (1982: Ch. 8) and Peacocke (1992: 109-11). Jerry Fodor (1998: 35) glosses a recognitional concept as a concept whose possession requires “the ability to recognize at least some things that fall under the concept as things that fall under the concept.” Fodor rejects recognitional concepts on the grounds that they do not meet a compositionality condition that he takes to be necessary for genuine concepthood. The recognitional capacities sometimes associated with grasp of a property do not consist in, or rest upon, the possession of a concept in any sense.

Extrapolative recognition essentially involves the formation of *predictions* about how the property-bearer continues into the perceptually inaccessible region. In identifying the partially occluded objects in the figure above as shapes of different kinds, one forms expectations about how, approximately, the objects would look if fully, or more fully, revealed. In the shape example, these expectations were fairly univocal. But that is not always the case. Sometimes the expectations countenance different possibilities. Consider, for example, the partially occluded word below.

ACTI 

How would you expect the whole object to look when uncovered? I assume that your expectation is not univocal. You probably acknowledge several possibilities: ACTION, ACTIVATE, ACTIVITY, etc. In this case, extrapolative recognition occurs with respect to *several* (lexical-syntactic) properties. This is the way in which extrapolative recognition will work in my account of how know-how guides skill.

4.2 Grasp of Normative Rankings

I want to give a similarly perception-based account of the cognitive upshot of grasping normative ranking relations between trajectory-properties. Where grasping trajectory-properties allows a subject to recognize their instances, grasping normative relations between these properties allows a subject to make perceptually based *judgments* as to their normative status. An apt analogy here is a wine-taster who grasps various normative facts about the quality of wines. Such grasp guides her in identifying the best of several wines on the basis of their flavors. Likewise, grasp of normative ranking relations between trajectory-properties enables a subject to identify which trajectory-properties rank higher relative to the standards of goodness for the practical kind.

The ability to make such comparative normative judgments between trajectory-properties which are extrapolatively recognized on the basis of perceptual feedback from one's skillful activity will figure centrally in my account of guidance, to which I now turn.

5 How Know-How Guides Skill

Any account of guidance should begin with the observation that know-how does not guide action all on its own; it does so through interaction with other mental states. What states are those? I will assume that they include at minimum the subject's *intention* to perform the action, and the subject's *perception* of what is currently happening regarding the unfolding of her activity.²⁵ When we ask for an account of guidance, we are asking for an account of how these states interact to enable appropriate modulation of a performance as it unfolds.

In developing this account I will operate with a few substantive, but I think reasonable, assumptions about perception and intention during skillful performance. Concerning perception, I will assume that perceptual experiences contribute to the guidance of action at least in part by *informing* the subject about what is going on with the features of the subject's current situation that are relevant to the assessment of how well the activity is going. To couch the point in terminology from Section 3, perceptual experiences inform the subject as to how things stand with the normatively privileged dynamical variables.²⁶ According to this idea, the role of perception in the guidance of skill is to monitor the features of the activity that matter for how well it is going.

Now for intention. I will assume that there is a kind of intention that is functionally implicated in the moment-to-moment guidance of action, which I will call a *guiding intention*.²⁷ The question whether intentions are beliefs, or are belief-like, has received much recent attention.²⁸ My account will assume that guiding intentions are belief-like only in two respects: First, they have

²⁵What about *mental* activities, such as computing a sum in one's head? Aren't they guided by know-how, but not in a way that involves perception? In these cases, I want to suggest that *introspection* plays a role analogous to perception in the case of embodied activities. See Armstrong (1968: 162-9) for a defense of the indispensability of introspection in intentional mental activity.

²⁶It would be a mistake to interpret this claim as suggesting that perceptual information enables the subject to assign a numerical value to the relevant dynamical variables. Adrian Cussins' description of knowing his speed on a motorcycle makes the point nicely:

The speed was given to me not as a truth-maker [i.e., a numerical value] ... but as an element in a skilled interaction with the world, as a felt rotational pressure in my right hand as it held the throttle grip, a felt vibration of the road and a rush of wind, a visual rush of surfaces, a sense of how the immediate environment would *afford* certain motions and *resist* others. (Cussins, 2002: 150)

²⁷Clarke (2010) and Setiya (2012) also endorse the idea that skilled activity, or activity which expresses know-how, is guided by the subject's intention to perform it. I will remain neutral as to the relation between guiding intentions and other forms of intention distinguished in the literature; for all I say here, guiding intentions could turn out to be identical to Searle's (1983: Ch. 3) intentions-in-action—which could in turn reduce to "intentions for the future" (as argued in McDowell, 2011).

²⁸See, for example, the exchange between Setiya (2008, 2009) and Paul (2009).

contents, which concern what is currently happening, as well as how the activity will continue into the future. And second, their functional role reflects conformity to a norm of accuracy: guiding intentions behave so as to keep their contents true. One manifestation of conformity to this norm is *evidence-sensitivity*: the content of an intention will tend to undergo update under the impact of perceptual feedback from the activity. Another way in which intentions can work to ensure their own truth is to influence the subject's unfolding activity so as to promote its conformity with the future-directed part of the intention's content.²⁹

Both of these aspects of a guiding intention's functional role have a place in my account. To begin to see how, let's attend to the first aspect at an arbitrary time, t , during the performance of an action. At t the subject's intention will encode information about what the subject is doing at that time. Let's not worry about exactly what information that is. The important observation is that whatever information is encoded in the intention from previous moments of the performance will be *updated* under the impact of perceptual input at t . If the subject enters t with some general sense of what she is doing, that sense will become more specific when perceptual input is registered and assimilated.

It is in this process of update that the subject's know-how first comes into play. I suggested above that knowing how involves grasp of a set of diachronic properties corresponding to activity space trajectories, and that this grasp has as its (partial) cognitive upshot the ability to perceptually recognize instances of those properties. That capacity, I suggest, manifests itself when a guiding intention gets updated under the impact of perceptual information. Suppose that perception informs the subject about the current evolution of the normatively privileged dynamical variables. The key move is to view this information as *partially disclosing* the trajectory-property that will characterize the completed performance currently underway. On the basis of this partial disclosure, the subject recognizes what is happening as compatible with a range of trajectory-properties compatible with the disclosure. In this way, the subject's guiding intention, know-how, and perception interact to generate awareness of the *possible continuations* of the activity.

What is going on here is an instance of the phenomenon of extrapolative recognition illustrated in Section 4.1 by means of the 'ACTI_____' example. Just as grasp of various lexical-syntactic properties guides you in forming expectations about how the partially occluded word might continue

²⁹Velleman (1989) and Bratman (1987), among others, emphasize this aspect of the functional role of intentions.

into the perceptually inaccessible region, grasp of the relevant trajectory-properties guides you in forming expectations about how the partially completed performance will continue to unfold in the next moments.

It may be helpful here to note that we are using unfamiliar theoretical apparatus to describe a recognizable, if somewhat subtle, aspect of the phenomenology of skilled action. While engaged in an activity that one knows how to perform, one will generally have an ongoing sense for the *possibilities* in that activity. As I swim the front crawl, I am aware of the possibility of slowing down, or the possibility of kicking harder, or (most likely) possibility of simply continuing to go on more or less as I already am. These possibilities correspond to different continuations of my performance through front-crawl-space.

Let us resume our story of guidance. At this point in the story, the subject has recognized what is currently happening as compatible with several possible continuations of the activity and updated the content of her intention accordingly. The next step in the story invokes the action-guiding role of intention: the subject's intention will guide her in modulating relevant aspects of her environment so as to actualize one of those possibilities. But how does the subject know which one to actualize?

The answer here invokes the idea from Section 4.2 that one of the cognitive upshots of grasping a way of ϕ ing is the ability to make perceptual judgments that track the normative ranking relations between trajectory-properties. Through the exercise of this capacity, one of the continuations of the activity—that is, one of the trajectory-properties that the performance could continue to instantiate—will strike the subject as best. And she will modulate her activity in conformity with that continuation.³⁰

Thus finishes my cognitivist (yet rule-free) account of how know-how *qua* grasp of a way guides skillful activity. In the next two sections I will apply the account to two issues connected with know-how and skill: the phenomenology of skillful action, and the notion of a practical mode of presentation.

³⁰This of course assumes that the subject's activity is governed by a standing intention to produce a *good* performance. If the subject intends to produce a merely mediocre performance, she will modulate her activity in conformity with one of the lower-ranked continuations. In this way a subject's know-how can guide her in making *voluntary errors* while performing an activity.

Aristotle thought that the capacity to intentionally err was a distinctive mark of skill (see Stanley and Krakauer (2013) and citations of Aristotle therein). The discussion in this section shows how that feature of skill can be explained in terms of a subject's know-how.

6 Experienced Mandates and the Phenomenology of Skill

As we saw in Section 2, Dreyfus' criticism of rule-based explanations of skillful action begins from certain phenomenological observations concerning skillful engagement in activities. While Dreyfus emphasizes the negative observation that skillful action often does not involve the consultation of rules, he also provides several noteworthy positive characterizations of the phenomenology of skill. Here is one of them:

[Consider] a tennis swing. If one is a beginner or is off one's form one might find oneself making an effort to keep one's eye on the ball, keep the racket perpendicular to the court, hit the ball squarely, etc. But if one is expert at the game, things are going well, and one is absorbed in the game, what one experiences is more like one's arm going up and its being drawn to the appropriate position, the racket forming the optimal angle with the court—an angle one need not even be aware of—all this so as to complete the gestalt made up of the court, one's running opponent, and the oncoming ball. (Dreyfus, 2002: 378-9)

Dreyfus' description of one's body being drawn in a certain way "so as to complete the gestalt" of the activity is somewhat obscure, but the same basic observation can be developed more systematically in connection with recent work by Susanna Siegel (2014) on 'experienced mandates'—"experiences of the environment as compelling you to act in a way that is solicited or afforded by the environment" (2). Siegel observes that the experience of seeing a "perfectly moist, frosted piece of chocolate cake resting on a plate with a fork on a napkin next to it" might involve a feeling of being drawn to eat the cake (4). In this case, one experiences the cake as compelling you to eat it.

The relevance of experienced mandates to skillful action emerges in Siegel's observation that "[experienced mandates] are generally structured by how you are already acting in a situation—not only by how you can act or are disposed to act in it." (2) Suppose I am riding a bicycle and feel myself leaning too far to the right. In this case I experience my current orientation as *calling for* a certain shift of weight or tweak to the handlebars, or whatever action is needed to correct my balance. Similarly, Dreyfus' tennis player experiences the gestalt of the tennis game as calling for a certain sort of swing.

Experienced mandates have two aspects: (1) an appreciation of a *possibility for action* at a given moment in an activity, and (2) a feeling of being *drawn by the environment* to act in that way. My account can explain these aspects respectively in terms of (1) extrapolative recognition of trajectory-

properties, and (2) awareness of the normative relationships between trajectory-properties. Let's unpack these two explanations in turn.

Starting with the first, recall that on my account of guidance a subject's know-how enables her to recognize a stretch of perceptual input as compatible with several trajectory-properties the activity partially instantiates. And as explained by means of the 'ACTI____' example, this recognition constitutes a set of *predictions* about how the activity will continue to unfold. Now these predictions concern the evolution of particular aspects of an activity—those aspects described by the normatively privileged dynamical variables. And normatively privileged dynamical variables describe those features of a subject's environment whose patterns of change determine *how well* the relevant action was performed. But now note that a good performance of an action is the sort of thing we attribute to a subject; the subject is responsible for the goodness of a well carried out activity. And this responsibility would be mysterious unless the subject could exercise *control* over the evolution of those variables.

If we suppose that the normatively privileged dynamical variables describe features of an activity under the subject's control, then the specification of how an activity will continue to unfold in terms of those variables amounts to a specification of a pattern of control that the subject might exert over her environment. In other words, the subject's sense for the possible continuations of the activity corresponding to the different trajectory-properties a perceptual episode partially discloses *just is* an appreciation for the possibilities of action at that moment. And so we derive the first aspect of experienced mandates.

The second aspect of experienced mandates is the feeling of *being drawn* to perform a particular action. From the perspective of my account, this feeling of being drawn is naturally identified with awareness of the normative relations between the trajectory-properties attributed on the basis of perceptual feedback from the activity. Grasp of these normative relations, on my account, guides the subject in selecting the best trajectory-property to continue instantiating once she has recognized the current unfolding of her activity as compatible with several such properties. It is entirely natural, I suggest, that this moment in guidance should manifest itself in the subject's experience as a feeling of being drawn to modulate the activity in conformity with the pattern of modulation specified by the best trajectory-property. The feeling of being drawn to act in a certain way is the subject's registration of the normative superiority of the trajectory-property which that

way of acting would continue to instantiate.

7 Practical Modes of Presentation

One of the two main cognitivist accounts mentioned in Section 1 was *intellectualism*. Intellectualists take knowledge how to ϕ to consist in knowledge of a proposition—viz., the proposition that some way is a way in which one could ϕ .

Formulated thus, intellectualism confronts obvious counterexamples: cases in which a subject knows the relevant fact about a way of ϕ ing but doesn't seem to know how to ϕ . Suppose Hannah witnesses Peter riding his bike and comes to know that *that* (ostending Peter's way of riding) is a way in which she could ride a bike.³¹ But assuming Hannah did not know how to ride a bike before encountering Peter, it does not seem that the new knowledge she derives from that encounter must, or even could, endow her with bicycle-riding know-how.

To avoid such counterexamples, intellectualists add a further condition to their analysis of know-how. Not only must a subject know the right proposition concerning a way of ϕ ing, but she must grasp that way of ϕ ing in a special way—under a *practical mode of presentation* (henceforth, 'PMP'). Although Hannah might grasp the appropriate way of ϕ ing by encountering Peter, she doesn't grasp it under a practical mode of presentation and so doesn't know how.

PMPs make the difference between the kind of propositional knowledge that amounts to genuinely practical know-how and the kind that does not. Thus the notion of a PMP is the linchpin of the intellectualist conception of know-how. But intellectualists have been relatively reticent about PMPs, and many have found them mysterious.³² Stanley and Williamson (2001) and Stanley (2011a) suggest that they can be understood in terms of the practical dispositions that come in their wake. But this suggestion violates the core cognitivist thought that know-how is something that *explains* practical dispositions, not something constituted by them. If PMPs are glossed dispositionally, then intellectualism can no longer stand as a candidate for a cognitivist account of know-how.³³

To avoid the complaint that PMPs are ad hoc posits that secure the connection between propo-

³¹See Stanley and Williamson (2001) and Stanley (2011a) for discussion of this kind of case.

³²See Koethe (2002), Schiffer (2002), Rosefeldt (2004), and Glick (2015).

³³See Pavese (2015: §1) for related criticism.

sitional knowledge and practical abilities essentially by stipulation, intellectualists must find a way of assimilating PMPs to familiar examples of modes of presentation. But this assimilation cannot rest upon the connection between modes of presentation and practical dispositions; instead it must somehow illuminate the explanatory connection between know-how and those dispositions.

The account of guidance sketched in Section 5 suggests a novel strategy for meeting these conditions.³⁴ To see how, note that that account contained an important elision. A central part of it, recall, was the idea that the guidance of action involves the subject's recognizing instances of trajectory-properties on the basis of perceptual feedback from the activity. Part of her ability to do this is explained in terms of her grasp of these properties, which is what her grasp of the relevant way partly consists in.

But in general, the ability to recognize a property on the basis of a certain kind of informational input requires more than just grasp of the property. The cases are familiar. The property of being Superman is one and the same as the property of being Clark Kent. But the ability to recognize that property on the basis of Clark-Kent-stereotypical perceptual input (glasses and tweed coat) is distinct from the ability to recognize that property on the basis of Superman-stereotypical perceptual input (red cape and tights).

This is exactly the kind of phenomenon that modes of presentation are typically invoked to explain.³⁵ The reason Lois Lane fails to recognize Superman as the person identical to Clark Kent is that Superman-stereotypical perceptual input does not appropriately match the Clark-Kentish mode of presentation under which she grasps that individual. For perceptual recognition of a property to get going, the perceptual information on the basis of which the recognition occurs must line up with the mode of presentation which characterizes the subject's grasp of that property.

The point holds for the trajectory-properties, perceptual recognition of which I claimed is essential to guidance. What my account elided, then, was the need for a manner of acquaintance with these properties that accounts for the subject's ability to attribute them *on the basis of the sorts of perceptual input characteristic of a given activity*. It is this need, I suggest, that a practical mode of presentation can fulfill. In order to recognize the current unfolding of my bicycle riding as one

³⁴Pavese (forthcoming) develops in detail an alternative approach—one which is at home in the kind of rule-based framework she adopts.

³⁵See Soames (2015: Ch. 5) for a discussion of the role of modes of presentation in perceptual identification.

that will lead to a crash unless a certain adjustment is made to the handlebars, I need to entertain my way of riding a bicycle in a way that lines up with the sorts of kinesthetic and proprioceptive perceptual input characteristic of riding a bike.

In effect, then, practical modes of presentation allow a subject's grasp of a way of ϕ ing to interface with perceptual feedback from the activity in the manner needed for the guidance of action. In this way we see how practical modes of presentation can do genuine explanatory work, *qua* modes of presentation as traditionally understood, with respect to the action-guiding role of know-how, and so find a place in a robustly cognitivist account of know-how.

8 Conclusion

I sketched a picture of know-how on which knowing how to ϕ involves grasping part of the internal normative structure of the action kind ϕ . I proposed a way of modeling this normative structure, and explained how grasp of it contributes to the capacity for skilled action.

One of the central payoffs of my account is the smoother way in which it handles unreflective skillful activity—activity that relies on perceptual registration of how to go on, rather than consultation of rules or regulative principles. But not all activity guided by our know-how is unreflective in this way. Suppose I memorize a recipe and recite it to myself *sotto voce* as I am cooking. Is this not a paradigm case of consulting rules as I act? And is it not also a paradigm case of being guided by my knowledge how? Here the rule-based account looks entirely appropriate.

How does my account handle such cases? According to the answer I want to give, following rules is itself something that one can know how to do. When a subject consciously follows rules for ϕ ing, she is exercising her knowledge how to follow those rules. But is she not also exercising her *knowledge how to ϕ* ? The answer I want to give relies on the idea that we can know things *by* knowing other things—as when I come to know David Foster Wallace by coming to know his essays, or come to know that Jones is a bachelor by coming to know that Jones is an unmarried male. Similarly, I want to suggest, a subject can come to know how to ϕ *by* coming to know how to follow a set of rules for ϕ ing. Is it this sort of mediated knowledge how to ϕ that the rule-following novice draws on as she practices ϕ ing for the first time.

But not all knowledge how must be mediated in this way. Indeed a mark of a highly developed

skill is that the know-how that guides it is *not* thus mediated. In this paper I have attempted to vindicate the idea that even such expert performance is expressive of an underlying cognitive achievement.

References

- Armstrong, David M. 1968. *A Materialist Theory of the Mind*. Routledge.
- Bengson, John and Moffett, Marc. 2011. "Nonpropositional Intellectualism." In John Bengson and Marc Moffett (eds.), *Knowing How: Essays on Knowledge, Mind, and Action*. Oxford University Press.
- Bengson, John and Moffett, Marc A. 2007. "Know-How and Concept Possession." *Philosophical Studies* 136:31–57.
- Bratman, Michael. 1987. *Intention, Plans, and Practical Reason*. Center for the Study of Language and Information.
- Brogaard, Berit. 2009. "What Mary Did Yesterday: Reflections on Knowledge-Wh." *Philosophy and Phenomenological Research* 78:439–467.
- . 2011. "Knowledge-How: A Unified Account." In J. Bengson and M. Moffett (eds.), *Knowing How: Essays on Knowledge, Mind, and Action*. Oxford University Press.
- Clarke, Randolph. 2010. "Skilled Activity and the Causal Theory of Action." *Philosophy and Phenomenological Research* 80:523–550.
- Cussins, Adrian. 2002. "Experience, Thought and Activity." In Y. Gunther (ed.), *Essays on Nonconceptual Content*. MIT Press.
- Dretske, Fred. 1988. *Explaining Behavior: Reasons in a World of Causes*. MIT Press.
- . 1989. "Reasons and Causes." *Philosophical Perspectives* 3:1–15.
- Dreyfus, Hubert L. 2002. "Intelligence Without Representation – Merleau-Ponty's Critique of Mental Representation the Relevance of Phenomenology to Scientific Explanation." *Phenomenology and the Cognitive Sciences* 1:367–383.
- . 2005. "Overcoming the Myth of the Mental: How Philosophers Can Profit From the Phenomenology of Everyday Expertise." *Proceedings and Addresses of the American Philosophical Association* 79:47–65.
- Evans, Gareth. 1982. *The Varieties of Reference*. 137. Oxford University Press.
- Fodor, Jerry A. 1975. *The Language of Thought*. Harvard University Press.
- . 1998. "There Are No Recognitional Concepts, Not Even RED." *Philosophical Issues* 9:1–14.
- Fridland, Ellen. 2015. "Knowing How: Problems and Considerations." *European Journal of Philosophy* 23:703–727.

- Glick, Ephraim. 2012. "Abilities and know-how attributions." In Mikkel Gerken Jessica Brown (ed.), *Knowledge Ascriptions*, 120–139. Oxford University Press.
- . 2015. "Practical Modes of Presentation." *Noûs* 49:538–559.
- Grice, Paul. 1974. "Method in Philosophical Psychology (From the Banal to the Bizarre)." *Proceedings and Addresses of the American Philosophical Association* 48:23–53.
- Hornsby, Jennifer. 2011. "Knowledge-How: A Unified Account." In J. Bengson and M. Moffett (eds.), *Knowing How: Essays on Knowledge, Mind, and Action*, 80–98. Oxford University Press.
- Koethe, John. 2002. "Stanley and Williamson on Knowing How." *Journal of Philosophy* 99:325–328.
- Korsgaard, Christine M. 1996. *The Sources of Normativity*. Cambridge University Press.
- . 2008. *The Constitution of Agency: Essays on Practical Reason and Moral Psychology*. Oxford University Press.
- Lewis, David K. 1986. *On the Plurality of Worlds*. Blackwell Publishers.
- McDowell, John. 2011. "Some remarks on intention in action." *The Amherst Lecture in Philosophy* 6:1–18.
- Noë, Alva. 2005. "Against intellectualism." *Analysis* 65:278–290.
- Paul, Sarah K. 2009. "Intention, Belief, and Wishful Thinking: Setiya on "Practical Knowledge"." *Ethics* 119:546–557.
- Pavese, Carlotta. 2015. "Practical Senses." *Philosophers' Imprint* 15.
- Peacocke, Christopher. 1992. *A Study of Concepts*. MIT Press.
- Price, H. H. 1946. *Thinking and Representation*. Haskell House.
- Rosefeldt, Tobias. 2004. "Is Knowing-How Simply a Case of Knowing-That?" *Philosophical Investigations* 27:370–379.
- Ryle, Gilbert. 1945. "Knowing How and Knowing That: The Presidential Address." *Proceedings of the Aristotelian Society* 46:1–16.
- . 1949. *The Concept of Mind*. Hutchinson and Co.
- Schaffer, Jonathan. 2007. "Knowing the Answer." *Philosophy and Phenomenological Research* 75:383–403.
- Schiffer, Stephen. 2002. "Amazing Knowledge." *Journal of Philosophy* 99:200–202.
- Searle, John R. 1983. *Intentionality: An Essay in the Philosophy of Mind*. Cambridge University Press.
- Setiya, Kieran. 2008. "Practical Knowledge." *Ethics* 118:388–409.
- . 2009. "Practical Knowledge Revisited." *Ethics* 120:128–137.
- . 2012. "Knowing How." *Proceedings of the Aristotelian Society* 112:285–307.

- Siegel, Susanna. 2014. "Affordances and the Contents of Perception." In Berit Brogaard (ed.), *Does Perception Have Content?*, 39–76. Oxford.
- Snowdon, Paul. 2003. "Knowing How and Knowing That: A Distinction Reconsidered." *Proceedings of the Aristotelian Society* 104:1–29.
- Soames, Scott. 2015. *Rethinking Language, Mind, and Meaning*. Princeton University Press.
- Stanley, Jason. 2011a. *Know How*. Oxford University Press.
- . 2011b. "Knowing (How)." *Noûs* 45:207–238.
- Stanley, Jason and Krakauer, John W. 2013. "Motor skill depends on knowledge of facts." *Frontiers in human neuroscience* 7.
- Stanley, Jason and Williamson, Timothy. 2001. "Knowing How." *Journal of Philosophy* 98:411–444.
- Stich, Stephen P. 1983. *From Folk Psychology to Cognitive Science*. MIT Press.
- Thomson, Judith Jarvis. 2008. *Normativity*, volume 70. Open Court.
- Velleman, David. 1989. *Practical Reflection*. Princeton University Press.