

Knowing How

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1. Introduction

‘Knowledge-how’ is the knowledge you have when you know *how to do something*. For example, when you know how to dance the tango, or solve a certain equation, or ride a bike, etc. Influenced by Ryle (1949), the traditional view of knowledge-how had two components: (1) a negative claim (*anti-intellectualism*) that knowledge-how is not any kind of knowledge-that (or any other propositional attitude state); and (2) a positive claim (*abilitism* or *dispositionalism*) that knowledge-how is some kind of ability or complex dispositional state. This traditional Rylean view¹ was, for a long time, a largely unquestioned feature of philosophical orthodoxy. There were occasional challenges to the traditional view but these challenges generated little sustained debate, and did not seriously threaten the orthodox status of Ryleanism.

This comfortable state of affairs was turned on its head by Stanley and Williamson’s (2001) paper ‘Knowing How’, which: (i) defended *intellectualism*—the view that knowing-how is a kind of knowing-that—against Ryle’s famous regress argument and other objections, (ii) argued against the Rylean’s positive claim that knowing is a kind of ability, and (iii) provided a linguistic argument for an intellectualist view according to which knowing how to Φ is a matter of knowing a proposition that answers the embedded ‘how to Φ ’ question. S&W’s paper helped to set off an explosion of new work on knowledge-how. The purpose of this paper is to survey some of the main developments in this literature over the last ten years (when necessary, some earlier works that are still important to these debates will also be discussed).

2. Knowledge-how and Action: What are the connections?

There are clearly important connections, of some kind, between knowing-how and action, and all theorists would agree that these connections are crucial to understanding the nature of knowledge-how. But the exact nature of these

¹ The relationship between this ‘Rylean’ view of knowledge-how and Ryle’s own views is far from straightforward, but those issues are beyond the scope of this discussion.

² Other related discussions include Noë (2005) and Glick (2012).

³ For criticisms see Glick (2015) for a critique of the overall strategy of appealing to PMPs, as well as

connections and how they bear on the intellectualism versus anti-intellectualism issue, are all matters of debate. Consider the following schemas that are meant to capture the idea that knowledge-how is a precondition of certain actions or abilities:

Action to Know-how Claims

(AK₁) If S Φ s then S knows how to Φ

(AK₂) If S has the ability to Φ then S knows how to Φ

(AK₃) If S Φ s *intentionally* then S knows how to Φ

(AK₄) If S has the ability to Φ *intentionally* then S knows how to Φ

As S&W (2001) pointed out, the unrestricted action claim (AK₁) is implausible because digesting, for example, is something that, at least grammatically speaking, one does, but it is not something that one knows how to do. So, (AK₁) as stated is false unless we implicitly interpret ' Φ ' as being restricted to 'doings' that we can genuinely attribute to agents in some more robust sense, rather than events like mere bodily happenings or processes. And similar points apply to (AK₂).

But, even so interpreted, there are other kinds of cases which look like putative counterexamples to both (AK₁) and (AK₂). Consider Hawley's (2003) case of Susie who reliably succeeds in annoying Joe whenever she tries to annoy him. However, Susie believes that she annoys Joe by her smoking, when really it is the tapping of her cigarette pack (that she does whenever she smokes) that is annoying Joe, not the smoking. Susie has a reliable ability to annoy Joe, and these actions of annoying Joe are properly attributable to her, but she does not know how to annoy him given her mistaken beliefs about how she annoys Joe. With cases like this in mind, most commentators think that if knowing how to Φ is a precondition for Φ -ing then it is only so with respect to *intentional* Φ -ings. For while Susie annoys Joe, she does not do so *intentionally* given her mistaken beliefs. And (AK₃) and (AK₄) (or close relatives of these claims) are endorsed by many different theorists across the intellectualist/anti-intellectualist divide.

Now consider the respective converses of (AK₁)–(AK₄), asserting that success in action, or the ability to so succeed, is a precondition of knowledge-how:

Know-how to Action Claims

- (KA₁) If S knows how to Φ then S Φ s
- (KA₂) If S knows how to Φ then S has the ability to Φ
- (KA₃) If S knows how to Φ then S Φ s intentionally
- (KA₄) If S knows how to Φ then S has the ability to Φ intentionally

(KA₁) and (KA₃) are trivially false, as obviously one can know how to Φ without it being the case that one is currently Φ -ing (intentionally or otherwise), and even without it being the case that one has ever Φ -ed in the past (I've never dropped a bowling ball on my foot but I certainly know how to do that). However, as with (KA₄), many philosophers—and, again, across the intellectualist/anti-intellectualist divide—have endorsed (KA₄) (or something close to it), which also entails the logically weaker (KA₂). And if both (KA₂) and (KA₄) are true then we can derive the following equivalence thesis

(A \equiv K) S has the ability to Φ intentionally if and only if S knows how to Φ .

But both directions of this biconditional have been questioned. In particular, there are a large number of potential counterexamples to its right-to-left direction, or (KA₄). These include cases where a subject both knows how to Φ and has an ability to Φ intentionally but then, supposedly, loses that ability—whilst still retaining the knowledge-how—through either a significant change in their environment or in themselves. For example, Snowdon (2003: 8) gives an environmental case where one still knows how to make Christmas pudding even after a “terrible explosion obliterates the world’s supply of sugar, so that no one is able to make it”. And S&W (2001) give the case of a master pianist who loses her arms in an accident and thereby, they claim, loses her ability to play the piano, whilst still knowing how to play it.

A common strategy in replying to such cases (Fridland 2015, Löwenstein 2017, Markie 2018) is to appeal to Hawley’s (2003) influential idea that knowing how to Φ does entail reliable success in action, but only in contextually relevant counterfactual circumstances, where usually these will be circumstances deemed to be *normal*.² The suggestion then is that even if the world’s sugar supply was obliterated one would still

² Other related discussions include Noë (2005) and Glick (2012).

have the ability to make a Christmas pudding *in normal circumstances where sugar is available*, and even if the pianist has lost her arms she still has the ability to play the piano *in normal circumstances in which she has arms*. Another way of representing this idea, is to see it as the suggestion that such examples are not counterexamples to (KA₄) if we interpret it in the following way (where the hyphens should be read as modifying the task that one knows how, or is able, to perform):

(KA₄) If *S* knows how to Φ -*in-circumstances-C* then *S* has the ability to Φ -*in-circumstances-C* intentionally

However, Bengson and Moffett (2011b: 170) have presented a more challenging putative counterexample:

Pi. Louis, a competent mathematician, knows how to find the n^{th} numeral, for any numeral n , in the decimal expansion of π . He knows the algorithm and knows how to apply it in a given case. However, because of principled computational limitations, Louis (like all ordinary human beings) is unable to find the 10^{46} numeral in the decimal expansion of π .

Unlike the pudding and pianist cases, there is no intuitively ‘normal’ set of circumstances here in which Louis is able to succeed in this task because “conditions would have to be extremely abnormal for Louis to succeed in finding the 10^{46} numeral in the decimal expansion of π when he tries: he would have to be superhuman, as it were” (*ibid*: 171). However, some commentators think this case can still be handled in broadly similar ways to the others (Cath 2015a, Löwenstein 2017).

A different strategy for defending (KA₄) is to appeal to different ways of disambiguating the logical form of ‘*S* knows how to Φ ’ ascriptions. As S&W pointed out an ‘*S* knows how to Φ ’ ascription has four legitimate interpretations resulting from the two available interpretations for the covert pronoun ‘PRO’ in the embedded question (as either a generic ‘one’ or anaphoric on the main subject), and the modal force of the infinitive (either a deontic ‘ought’ or an ability ‘could’). The interpretation relevant to the knowing-how debates is the one where ‘PRO’ is anaphoric on the main subject, and the infinitive gets its ability interpretation.

Now consider the example of a ski instructor who knows how to perform a certain difficult trick that they have never been able to perform themselves, and which only

the very best athletes can perform (S&W 2001, Stanley 2011a). Is this a counterexample to (KA₄)? Stanley (2011a) argues that it is not on the grounds that the only sense in which the instructor can be correctly said to know how to perform the trick is on one of the deontic readings. The instructor knows how to do the trick in the sense that she knows, of some way *w*, that *w* is a way she/one *ought* to do the trick, but it is not the case that she knows, of some way *w*, that *w* is a way that she *could* do the trick. And (KA₄) is only meant to apply to that last interpretation.

Putative counterexamples to (AK₄) are less common but, again, Bengson and Moffett (2011b) have presented an important case. Bengson and Moffett's example involves a case where, they claim, a subject already has the ability to intentionally perform a certain complex action (of building a Kytoon) that they have not yet attempted, but they only know how to perform the different sub-parts of that action, not the action itself as a whole. For critical discussion see Constantin (2018), Löwenstein (2017) and Markie (2018).

3. Ryleanism and Action

It might seem as if Rylean views should have an easy time in accounting for the connections between knowledge-how and action. After all, if the Rylean's positive claim is true—that is, if we can identify knowing how to Φ with some kind of ability to Φ or set of dispositions involving Φ -ing—then it follows that knowing how to Φ entails the possession of that given ability or those dispositions, and vice versa. But, of course, the Rylean is also thereby vulnerable to any putative counterexamples to these supposed entailments. This is why the kinds of examples mentioned in §2 are often discussed in the context of assessing their status as potential counterexamples to Ryleanism.

However, even if these attempted counterexamples can all be answered there are other challenges that can be made to Ryleanism related to the connection between knowledge-how and action. Suppose (A \equiv K) is true. The Rylean might naturally suggest that the truth of (A \equiv K) reflects the fact that we can analyse knowing how to Φ solely in terms of having the ability to Φ intentionally (Setiya 2012), with no need to appeal to any cognitive states like knowledge-that or true belief. However, one might reply that one cannot explain the ability to Φ *intentionally*, without appealing to the cognitive states involved in guiding intentional action. And Pavese (2018) has

recently made a strong theoretical case for thinking that Φ -ing intentionally entails having a true belief about how to Φ .

This issue connects with a big-picture worry for Rylean views which is that they cannot account for the epistemic or cognitive dimensions of knowledge-how, given that the abilities (or dispositions) that feature in their analyses are not meant to involve any states of knowledge-that or true belief. Annas (2001: 248) voices this kind of worry when she suggests that if knowledge-how does not involve any kind of knowledge-that then it cannot be more than an “inarticulate practical knack”, and Bengson and Moffett (2011a, 2011b) argue at length that Rylean views cannot account for the cognitive dimensions of knowledge-how.

For a long time worries of this kind did not receive enough attention from neo-Ryleans. But, recently, a number of theorists have been developing broadly Rylean views which tackle these kinds of issues head on, see, for example, Habgood-Coote (2018a), Elizinga (2017, 2019), Löwenstein (2017), Kremer (2016), and Markie (2018). Some of these theorists relax the constraint that the relevant abilities not involve any states of knowledge-that, by claiming that these abilities will entail the possession of certain forms of knowledge-that (Löwenstein 2017, Habgood-Coote 2018a). Others, like Elzinga (2019), try to understand the intelligence of knowledge-how without appealing to knowledge-that at all. A common theme in many of these works is to attempt to explain the cognitive or epistemic properties of knowledge-how in terms of the norms regulating actions and abilities.

4. Intellectualism and Action

While Ryleans can face difficulties in dealing with the close relationship between knowledge-how and action, there is no doubt that intellectualists are more commonly thought to have problems in accounting for this relationship. Many of these objections stem from the general suspicion that the practical dimensions of knowledge-how could never be accounted for in terms of a cognitive state like knowledge-that.

One action-based objection is the simple *insufficiency objection* that intellectualism is false because knowledge-that (of the relevant kind) is insufficient for knowledge-how. Suppose Stephanie has never tried to play the violin and, hence, does not know how to play it. Nonetheless Stephanie can know that *that* way [pointing to the way that

someone else is playing the violin] is a way to play the violin. Furthermore, she can even know that that way is a way for *her* to play the violin, or at least that it would be after having the relevant training. In which case, it seems that Stephanie could know the kinds of propositions that feature in intellectualist analyses of knowledge-how, whilst failing to know how to play the violin. This objection relates to the right-to-left direction of (A \equiv K) because one might think that the reason why mere knowledge-that is not sufficient for knowledge-how, is that knowing how to Φ entails the possession of certain abilities or dispositions to Φ , which are not entailed by any mere knowledge of propositions about how to Φ .

One possible response is to concede that mere knowledge-that is not sufficient for knowledge-how, but then maintain that knowledge-how can be identified with a special kind of knowledge-that involving some further condition. The most well known account of this kind is S&W's (2001: 429) appeal to a *practical mode of presentation* (PMP) condition, where meeting this condition is meant to entail the possession of dispositions related to the activity of Φ -ing. S&W's own version of this strategy—on which a PMP is a special way of being related to a coarse-grained 'Russellian' proposition—was widely criticised for being elusive and lacking in details. In latter work, Stanley (2011a) developed a more detailed 'Fregean' view on which a PMP is assumed to be a special constituent of the fine-grained proposition that one knows when one knows how to Φ . Pavese (e.g. 2015, 2017a) develops a different and explanatorily powerful Fregean view based on an analogy between PMPs and computer programs.³

A different way of responding to the insufficiency objection is to appeal to the idea that knowing how to Φ is a matter of knowing that one has a certain kind of ability. Brogaard (2009) gave the first version of this kind of reply, and Stanley (2011a) develops a detailed version of it that draws on Hawley's (2003) work again, and also Kratzer (1977). Stanley's account can be, roughly, characterised as the claim that 'Stephanie knows how to play the violin' is true only if, for some way w , Stephanie knows that w is a way that she could play the violin *in circumstances where she is in her normal physical state*. But, given that Stephanie has never trained to play the violin, it is *not* the case that the way she observes is a way that she could play the

³ For criticisms see Glick (2015) for a critique of the overall strategy of appealing to PMPs, as well as specific criticisms of S&W (2001) and Stanley (2011a). See Mosdell (2018) for a recent critique of Pavese's account.

violin in *those* specific circumstances, for in her normal physical state she lacks any of the dispositions involved in performing the relevant hand movements etc. In which case, Stephanie does not know a proposition that answers the relevant interpretation of the embedded ‘how’ question, and if she did know the right proposition that would entail her possessing a relevant ability to play the violin.

Another action-based objection to intellectualism—which is related to both directions of (A≡K)—is the famous *regress objection* that this view must be false because assuming it to be true, together with other auxiliary premises, leads to an infinite and vicious regress. Characterisations of these auxiliary premises vary, but they often boil down to something like this:

- (i) If S performs an action Φ intelligently then S’s success in Φ -ing is explained by S’s knowing how to Φ .

- (ii) If S’s state of knowing that p explains S’s success in Φ -ing intelligently it does so only in conjunction with (or in virtue of) S’s distinct action(s) of intelligently selecting and applying that knowledge-that.

These claims, together with the *reductio* assumption that knowing how to Φ is a kind of knowing-that, are then meant to generate an infinite and vicious regress of distinct actions and states of knowledge. Premise (i) is a close relative of (AK₃) and is normally not contested by intellectualists, although they will point out that it only holds true given the restriction to intelligent Φ -ings (S&W 2001). Premise (ii) is where most of the action takes place, and this premise relates to (KA₄) because one idea behind it seems to be that, unlike knowing how to Φ , merely knowing propositions about how to Φ does not entail having any relevant abilities or dispositions to succeed in Φ -ing.

Anti-intellectualists often try to motivate claims like (ii) by claiming, following Ryle (1946, 1949), that if the selection and application of one’s knowledge-that were not intelligent then one might have selected the wrong proposition, or one might have the right proposition but fail to see how to apply this general truth to the particular circumstances in which one tries to act (see e.g. Fridland 2013, Löwenstein 2017, and Small 2017). Against (ii), one strategy for the intellectualist is to claim that the regress can eventually be stopped by automatic and non-intelligent mechanisms for

applying knowledge-that⁴ (Stanley 2011a, Stanley and Krakauer 2013). Fridland (2013, 2014, 2017a, 2017b) has done a lot of significant work in exploring and criticising this idea.

Whether there is a successful regress argument against intellectualism about knowledge-how is still a contested issue. But in many ways the debate has shifted focus to related, but still distinct, issues about whether there is a successful regress-type argument against intellectualist views of skills and skilled action (see e.g. Weatherson 2017). Relatedly, the knowledge-how debates have helped to stimulate a wave of important new work on skills, the relationship between skills and knowledge-how, and the connections between these topics and relevant empirical questions (e.g. about the format of the representations involved in the control of motor behaviour).⁵

5. *The Epistemic Profile of Know-How*

The traditional arguments against intellectualism, influenced by Ryle (1949), typically focused on the supposed difficulties that intellectualists have in accounting for the relationship between knowledge-how and action. But another approach one can take is to argue against intellectualism on the grounds that knowledge-how has a different *epistemic profile* from knowledge-that (e.g. Cath 2011, Carter and Pritchard 2015a, Poston 2009, Setiya 2009, 2012, and Zardini 2013).

I think a good way of developing this kind of argument is to note, first, that *if* intellectualism is true then for any necessary condition for possessing knowledge-that there will be a parallel necessary condition for possessing knowledge-how. For example, consider the following claims:

- (1) If S knows that p then S has a true and non-Gettierized belief that p
- (2) If S knows that p then S is justified in believing that p
- (3) If S knows that p then S believes that p

⁴ A response that has its origins in Fodor (1968).

⁵ See e.g. Dickie (2012), Fridland (2013, 2014, 2017a, 2017b), Levy (2017), Pavese (2016a, 2016b, 2018), Riley (2017), Stanley and Krakauer (2013), Stanley and Williamson (2017), and Weatherson (2017).

The schemas stated by (1)–(3) are widely accepted as capturing necessary conditions for possessing knowledge-that.⁶ Suppose now that intellectualism is true. In particular, a version of intellectualism where if S knows how to Φ then, for some way w , S knows that w is a way for S to Φ . If this view were true, and if (1)–(3) are all true, then the following must also state necessary conditions for possessing knowledge-how:

(1*) If S knows how to Φ then, for some way w , S has a true and non-Gettierized belief that w is a way for S to Φ .

(2*) If S knows how to Φ then, for some way w , S is justified in believing that w is a way for S to Φ .

(3*) If S knows how to Φ then, for some way w , S believes that w is a way for S to Φ .

One possible strategy then for arguing against intellectualism is to assume that one of (1)–(3) is true, argue that the parallel condition (1*)–(3*) for knowing-how is false, and thereby conclude that intellectualism is false. And a lot of epistemic divergence arguments can be viewed as fitting (more or less) with this general pattern of argument. In particular, there has been lot of attention on supposed Gettier-style counterexamples to (1*).

Cath (2011), for example, gives a case where Charlie wants to learn how to change a light bulb. Charlie finds a ‘how to’ book and grasps a set of clear and accurate instructions in it describing a way to change a light bulb, call this way ‘ w_I ’. So, Charlie now has a true belief that w_I is a way for him to change a light bulb. However, what Charlie doesn’t realise is that he is extremely lucky to not be reading misleading instructions, that do not describe a way to change a light bulb at all. This is because the disgruntled author purposely filled her book with misleading instructions. However, a computer error at the printers then resulted in the text under the ‘Changing a Light Bulb’ entry, in just one copy of the book, to be randomly replaced by new text which, by an incredible coincidence, provided the clear and accurate set of instructions that Charlie would later consult.

⁶ It is, of course, notoriously difficult to analyse what a ‘Gettierized’ belief is exactly. But, nonetheless, there is a consensus view that knowledge-that is incompatible with the epistemic luck present in paradigmatic Gettier cases. In which case, the concept of a ‘non-Gettierized’ belief can at least be grasped by ostension.

Cath claims that this *lucky light bulb* case is a counterexample to intellectualism on the grounds that both of following claims are true (where t_1 is a time just after Charlie has read the instructions): (KH) At t_1 Charlie knows how to change a light bulb (the *knowledge-how* claim), and (NKT) At t_1 Charlie's belief that w_1 is way for him to change a light bulb does not constitute knowledge-that (the *no-knowledge-that* claim).

The support for (NKT) is simply the orthodox assumption that knowledge-that is incompatible with Gettier-style luck, as represented in (1) above. (KH) can be supported by the intuition that Charlie knows how to change a light bulb. But, as Cath discusses, it can also be supported by an argument from the left-to-right direction of (A=K):

(AK₄) If S has the ability to Φ *intentionally* then S knows how to Φ

For it is very plausible that Charlie has the ability to change a light bulb intentionally at t_1 , and if both that assumption and (AK₄) are true it follows that (KH) is true. In this way epistemic divergence arguments can be seen as relying on the idea that knowledge-how is a precondition of intentional action, and that many of the preconditions for knowledge-that are not preconditions for intentional action.

How should intellectualists reply to Gettier-style cases like this? The orthodox response is to accept (NKT) and deny (KH), and then there are various strategies adopted in support of that response. Stanley (2011b), for example, argues that the intuition that Charlie knows how to change a light-bulb is untrustworthy by appealing to a variant on this case—*the lucky light bulb II*—which parallels the original except it focuses on knowing *where to find a light-bulb*. Stanley claims that the intuition that Charlie still knows where to find a light bulb in his Gettier-style case is just as strong as the intuition that (KH) is true, and he concludes that Cath's argument thereby "proves too much", with the background assumption being that knowing-where is obviously a kind of knowing-that.

In reply, Carter (2012: 760) suggests that Stanley's overgeneralization point "counts against the efficacy of Cath's counterexample just as much as it would support a *distinction* between knowledge-wh and knowledge-that". And Cath (2015a) argues that even if we accept Stanley's argument it doesn't show us *how* to avoid the putative counterexamples, as it only establishes, at best, that we must reject (NKT) or (KH),

but not which claim we should reject. In which case, it might be that the intellectualist is best advised to adopt an unorthodox response that endorses (KH) but rejects (NKT), and Brogaard (2011) and Cath (2015a) have each developed different intellectualist responses of this broad kind.

A different strategy for the orthodox intellectualist is to argue directly that the ability to Φ intentionally is incompatible with Gettier-style luck. Pavese (2018) has recently offered an argument of this kind in reply to Cath (2015a), and in defence of Gibbons' (2001) putative examples of agents who Φ but fail to Φ -intentionally because their relevant true beliefs about how to Φ are 'Gettierized' beliefs.

Another notable response to the Gettier issue, is given by Carter and Pritchard (2015a), who argue that (KH) is false because knowledge-how is incompatible with the 'interventionist' form of epistemic luck present in that case. However, they present a variant on the lucky light bulb case involving only 'environmental' epistemic luck (Charlie picks up the one accurate guide on a shelf full of fake guides), and they claim that in this variation knowledge-how does persist in the absence of knowledge-that.

The main focus in discussions of the epistemic profile of knowledge-how has been on the anti-luck condition, but there have also been challenges to intellectualism related to the justification and belief conditions. Cath (2011), for example, presented putative counterexamples to (2*) and (3*), as well as (1*). See also Carter and Navarro (2017) for related challenges to (2*), and Wallis (2008) and Brownstein and Michaelson (2016) each appeal to (respectively different) cases from empirical psychology in arguing against (3*).

More recently, a new divergence objection has emerged with Carter and Pritchard (2015b) and Poston (2016) arguing against intellectualism on the grounds of an alleged divergence with respect to testimony, with the suggestion being that knowledge-how is harder to gain via testimony than knowledge-that and other forms of knowing-wh. Cath (2017) offers a response from an intellectualist perspective, and Peet (2018) offers a response which does not presuppose a stance on the intellectualist/anti-intellectualist issue.⁷

⁷ Hawley (2010) is the first major discussion of knowledge-how and testimony, but her important discussion is not directly engaged with this epistemic divergence argument.

6. Methodology, Linguistics, and Cognitive Science

S&W's (2001) linguistic argument relied on syntactic and semantic premises. The syntactic premise is that a knowledge-how ascription like 'Hannah knows how to ride a bicycle' shares a common structure (involving an embedded question containing a covert pronoun and an infinitive) with knowing-wh ascriptions like 'Hannah knows where to find a nickel', 'Hannah knows whom to call for help', and 'Hannah knows why to vote for Gore'. The semantic premise is, roughly, that the latter knowing-wh ascriptions are true just in case the subject stands in the knowing-that relation to some proposition p that answers the given embedded question. On basis of these linguistic premises, S&W conclude that the default view should be that the same question-answer semantics extends to 'S knows how to Φ ' ascriptions.

Critical responses to this argument can be divided into two broad (and often overlapping) types: linguistic replies and methodological replies. One kind of linguistic reply is to contest the linguistic premises directly, by appealing to alternative analyses of the logical form or the semantics of English knowing-wh ascriptions. Another kind of linguistic reply appeals to cross-linguistic data that appears not to fit with the intellectualist analysis (e.g. Ditter 2016, Rumfitt 2003 and Wiggins 2012). For example, languages like French and Italian where the sentences which translate English 'S knows how to Φ ' ascriptions have a bare infinitive as the complement of 'knows', rather than an embedded question. Stanley (2011a) responds to this kind of challenge by arguing that these sentences in other language are best interpreted as containing an implicit interrogative (see Abbott 2013 and Ditter 2016 for criticisms). Pavese (2016b) questions the significance of the cross-linguistic data, arguing that it does not support the conclusion that English 'S knows how to Φ ' ascriptions are ambiguous between an interrogative and a bare infinitive interpretation.

Methodological criticisms of S&W's linguistic argument often start with the thought that there is something wrong with using mere linguistic premises, about knowledge-how ascriptions, to support substantive conclusions about the nature of knowledge-how itself. Perhaps most notably, Glick (2011) argues that S&W's linguistic argument can at best establish *weak intellectualism* (the mere thesis that knowing-how is some kind of relation to a proposition) but not *strong intellectualism* (the thesis that it is a

relation to a proposition that satisfies some significant subset of the properties standardly attributed to the knowledge-that relation).

One thing that can be said on S&W's behalf here is that their argument is most charitably interpreted as being *enthymematic* (Cath 2015b), relying on further implicit premises that, together with the linguistic premises, establish strong and not merely weak intellectualism. In particular, a semantic uniformity premise asserting that 'knows' has one unique semantic value in all relevant knowing-wh (including knowing-how) and knowing-that ascriptions, and another premise stating that the semantic value of 'knows' in knowledge-that ascriptions is a relation with such-and-such standard epistemic properties (e.g. a true belief that satisfies anti-luck and justification conditions).⁸

Critics of S&W's linguistic methodology might change tack and grant that the problem is not that linguistic considerations can never support metaphysical conclusions. Rather, the problem is that S&W put too much *weight* on these factors as opposed to other considerations, especially work in the cognitive sciences on topics like the procedural versus declarative knowledge/memory distinction (Brown 2013, Devitt 2011a). But it is worth noting that S&W (2001) did not merely rely on their linguistic argument, as they also offered substantive replies to various non-linguistic objections to their view. And Stanley (2011) has tried to argue that intellectualism is not threatened by the kinds of empirical considerations that have been claimed to support anti-intellectualism. These arguments may fail but they remind us that intellectualists have never just ignored the potential relevance of non-linguistic considerations.

More positively, I think one can partially defend S&W's general linguistic approach to knowing-how—if not their linguistic argument per se—by pointing to the fruitfulness of this approach. Even the most ardent anti-intellectualist would be hard

⁸ Of course, the debate can then turn to these further premises. But the point remains that it is uncharitable to regard S&W's argument as committing some kind of methodological blunder. As I see it, the real value of Glick's discussion of S&W is that it shows us how their argument crucially relies on these implicit premises, and how intellectualists sometimes lean on those premises in question-begging ways when replying to opponents. In relation to the semantic uniformity premise, there has been a lot of discussion about whether intellectualists have provided good evidence for/against claims of this kind, and the difference between the evidence needed to reject a strict ambiguity claim versus a polysemy claim about knowledge-how ascriptions (for related discussion see e.g. Abbott 2013, Kremer 2016, Löwenstein 2017, and Sgaravatti and Zardini 2008).

pressed, for example, to deny that S&W's distinction between the four different interpretations of 'S knows how to Φ ' ascriptions, has been very useful for clarifying a number of issues to do with knowledge-how. This only suggests that linguistic considerations have *some* value, and so does not address the weighting objection. But this modest point is often obscured in these discussions of methodology. Looking back over the past ten years, my impression is that the knowledge-how debates have been fruitful in large part because of a kind of (implicit) methodological pluralism, with a diverse range of theories, disciplines, and methods, being brought to bear on these issues.

7. Other Recent Developments

There have been lots of other developments that do not fit neatly into the broad themes discussed above. This includes new arguments, and new replies to old arguments. For example, Habgood-Coote (2018b) argues that intellectualism faces a *generality objection* akin to the famous generality problem for reliabilism. On the intellectualist side, Pavese (2017b) convincingly shows how intellectualists can answer the *gradability* objection that intellectualism is false because knowledge-how comes in degrees whereas knowledge-that does not (Ryle 1949, Sgaravatti and Zardini 2008).

Another development is the emergence of views of knowing-how that bend, or break out of, the familiar categories of 'intellectualism' and 'Ryleanism'. Bengson and Moffett (2011b), for example, develop a view on which knowing-how is a (non-propositional and non-dispositional) objective attitude to a way of Φ -ing. Santorio (2016) offers a non-factualist view of knowing-how, influenced by expressivist views in metaethics. And Hetherington (2011) develops a view according to which knowing-that can be analysed in terms of knowing-how.⁹

There has also been a lot of work on connections between knowledge-how and other topics, including: epistemic injustice (Hawley 2011), the philosophy of education (Winch 2016, Kotzee 2016), 'what it is like'-knowledge (Tye 2011), the philosophy of sport (Breivik 2014), and knowledge of language (Tsai 2011, Devitt 2011b). Others

⁹ This kind of view—which Hetherington calls *practicalism*—has been around in different forms for a long time. But Hetherington's discussion is significant for developing it in greater detail, and also for considering this view in relation to the more recent know-how literature.

have expanded the boundaries of the debate by arguing against intellectualist analyses of knowing-wh more generally (Masto 2010, Farkas 2016, 2017). And one last development worth mentioning is the emergence of work focused on questions about the value or function of knowledge-how (Carter and Pritchard 2015b, Habgood-Coote 2019, Hawley 2011, Markie 2018).

One area that has not seen a lot of development is ‘experimental philosophy’ (X-Phi) on the intuitions appealed to in the knowledge-how debates. There have been some X-Phi studies on knowledge-how (Bengson, Moffett, and Wright 2009, Carter, Pritchard, and Shepherd 2019), but still nothing like the volume and diversity of studies found in other areas of epistemology. It will be interesting to see whether there is more work in this area in the future.

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