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## The folk on knowing how

John Bengson · Marc A. Moffett · Jennifer C. Wright

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**Abstract** It has been claimed that the attempt to analyze know-how in terms of propositional knowledge over-intellectualizes the mind. Exploiting the methods of so-called “experimental philosophy”, we show that the charge of over-intellectualization is baseless. Contra neo-Ryleans, who analyze know-how in terms of ability, the concrete-case judgments of ordinary folk are most consistent with the view that there exists a set of correct necessary and sufficient conditions for know-how that does not invoke ability, but rather a certain sort of propositional knowledge. To the extent that one’s considered judgments agree with those of the folk (or to the extent that one is unwilling to contravene widespread judgments), this constitutes a strong *prima facie* case against neo-Ryleanism.

**Keywords** Ability · Anti-intellectualism · Intellectualism · Know-how · Over-intellectualization · Praxism · Propositional knowledge · Understanding

### 1 Know-how: the philosophical debate

Beginning with Ryle’s (1946, 1949) attack on what he unsympathetically labeled the “intellectualist legend”, philosophical discussion of the nature of know-how has

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focused on whether knowing how is equivalent to some form of propositional knowledge, or instead a certain sort of ability. That is, is there some sort of propositional knowledge or, alternatively, some sort of ability that is necessary and sufficient for knowledge how to perform a given activity? So understood, the philosophical debate over the nature of know-how centers on the following two views:

*Radical intellectualism*

$x$  knows how to  $\psi$  if and only if  $x$  possesses a certain sort of propositional knowledge regarding  $\psi$ .

*Neo-Ryleanism*

$x$  knows how to  $\psi$  if and only if  $x$  possesses a certain sort of ability to  $\psi$ .<sup>1</sup>

Both neo-Ryleanism and radical intellectualism offer necessary and sufficient conditions for know-how.<sup>2</sup> They thus mark out extremes between which lie a variety of intermediate positions. Consider, for instance, the following four views:

*Intellectualism*

$x$  knows how to  $\psi$  if  $x$  possesses a certain sort of propositional knowledge regarding  $\psi$ .

*Anti-intellectualism*

Intellectualism is false. Stated positively:  $x$  knows how to  $\psi$  only if  $x$  possesses a certain sort of ability to  $\psi$ .<sup>3,4</sup>

*Praxism*

$x$  knows how to  $\psi$  if  $x$  possesses a certain sort of ability to  $\psi$ .

*Anti-praxism*

Praxism is false. Stated positively:  $x$  knows how to  $\psi$  only if  $x$  possesses a certain sort of propositional knowledge regarding  $\psi$ .<sup>5</sup>

<sup>1</sup> While this thesis may not reflect the complexity of Ryle's own treatment of know-how, it remains an important position in analytic epistemology. Thanks to Brian Weatherson for discussion on this point.

<sup>2</sup> One may further understand neo-Ryleanism and radical intellectualism as offering (a priori or a posteriori) *reductive* analyses of knowledge how to  $\psi$ , though this is certainly not required. For this reason, it is misleading to characterize neo-Ryleanism and radical intellectualism as wedded to the apparently reductive claims that knowledge how to  $\psi$  "consists" in or is a "species" of ability or propositional knowledge, respectively.

<sup>3</sup> It is important that anti-intellectualism, like neo-Ryleanism, requires the *corresponding* ability. One need not be an anti-intellectualist in order to allow that *some* ability (e.g., the ability to breathe or think or apply concepts) might be required for know-how. One implication is that Noë's (2005, pp. 285–286) modified regress argument poses no threat to intellectualism.

<sup>4</sup> Obviously, the positive and negative formulations are not equivalent. However, acceptance of the negative thesis makes it extremely difficult to resist the positive thesis. It is therefore no surprise that, at least to our knowledge, those philosophers adopting the negative thesis have almost without exception adopted the positive thesis as well.

<sup>5</sup> Once again, the positive and negative formulations are plainly not equivalent, though acceptance of the negative thesis make it very difficult to resist the positive thesis. See note 22 for further discussion. Incidentally, we should point out that, strictly speaking, radical intellectualism, intellectualism, and anti-praxism should be understood as invoking some sort of propositional attitude. Because knowledge is the natural candidate, we ignore this complication in what follows. See Bengson and Moffett (unpublished manuscript) for discussion.

As this taxonomy makes clear, while radical intellectualism is the conjunction of intellectualism and anti-praxism, neo-Ryleanism is the conjunction of anti-intellectualism and praxism.

All of these views are theses about the nature of one particular sort of know-how, namely, knowledge how *to*  $\psi$ . As formulated, they are silent, at least on their face, about other forms of “knowledge how”, such as knowledge how *one*  $\psi$ -s, knowledge how *people*  $\psi$ , knowledge of how  $\psi$ -ing is done, and knowledge how *F*-s  $\psi$ . We consider this to be a virtue of our taxonomy. For otherwise both theses of neo-Ryleanism would be open to obvious counterexamples, in which case the debate would be a non-starter. Consider, first, the anti-intellectualist claim that ability is necessary for know-how, and thus know-how is sufficient for ability. Suppose that Martin knows how turtles reproduce. It is implausible that Martin thereby has the corresponding ability to engage in turtle reproduction (whatever that might mean).<sup>6</sup> Likewise, it would be implausible to suppose that Martin is able to run a marathon simply because he knows how people run marathons, how marathons are run, and so on. Now consider praxism, according to which ability is sufficient for know-how, and thus know-how is necessary for ability. Clearly, Martin might be able to sex chickens while failing to know how he—or anyone else—does so. Likewise, Martin could be the world’s greatest chicken-sexer yet lack knowledge of how chicken-sexing is done. As these examples suggest, neo-Ryleanism is not plausible as a theory of knowledge how *one*  $\psi$ -s, knowledge how *people*  $\psi$ , knowledge of how  $\psi$ -ing is done, or knowledge how *F*-s  $\psi$ ; on the contrary, these seem ripe for a radical intellectualist style of analysis. This means that if neo-Ryleanism is to have any plausibility whatsoever, it is only as a theory of knowledge how *to*  $\psi$ . Hence, the philosophical debate over the nature of know-how is ultimately a debate over one particular sort of know-how, namely, knowledge how *to*  $\psi$ . (Hereafter, we follow participants in this debate in using ‘know-how’ to refer only to knowledge how *to*  $\psi$ .)

For various reasons, many contemporary philosophers are intellectualists; they reject anti-intellectualism and, therefore, neo-Ryleanism.<sup>7</sup> However, there remain a significant number who believe that intellectualism fails to do justice to the allegedly non-cognitive nature of know-how: “Intellectualism,” it is said, “over-intellectualizes the mind” (Noë 2005, p. 286). Anti-praxism appears to be subject to the complaint of over-intellectualization to an even greater extent: it, too, appears to many philosophers to mishandle the non-cognitive nature of know-how. Insofar as intellectualism and/or anti-praxism are considered guilty of over-intellectualization, they are seen as conflicting with ordinary judgments about know-how. Whereas intellectualism and anti-praxism entail that some cognitively demanding state, namely, a certain sort of propositional knowledge, is necessary and/or sufficient for know-how, ordinary judgments about know-how are not sensitive to the presence and/or absence of such a state; rather, it is claimed, such judgments are sensitive to the absence and/or presence of some other less “intellectual” state, namely,

<sup>6</sup> Thanks to an anonymous reviewer for suggesting this example.

<sup>7</sup> Intellectualism is endorsed by Brown (1970), Ginet (1975, p. 8), Craig (1990, p. 158), Hyman (1999), Stanley and Williamson (2001), Snowdon (2004), Braun (2006), Bengson and Moffett (2007, unpublished manuscript), and Brogaard (forthcoming), among others.

ability.<sup>8</sup> Since there is a strong presumption against philosophical views which conflict substantially with widespread judgments, this view of ordinary judgments about know-how serves to motivate the rejection of intellectualism and/or anti-praxism.<sup>9</sup>

Given the dialectical role of the charge of over-intellectualization, we consider it important to set the record straight concerning the alleged sensitivity of ordinary judgments of know-how to the absence and/or presence of ability, as anti-intellectualists and praxists maintain. In what follows, we present empirical research which indicates that the claim that anti-intellectualist and praxist judgments are prevalent is mistaken on both counts. In truth, the concrete-case judgments of ordinary folk are most consistent with radical intellectualism: such judgments appear to be sensitive not to the presence and/or absence of ability, but rather to the presence and/or absence of a certain sort of propositional knowledge. Consequently, our studies level the playing field concerning the burden of proof for intellectualists and anti-praxists and, in particular, help assuage the worry that they have over-intellectualized know-how. In addition, to the extent that one's considered judgments agree with those of the participants in our studies (or to the extent that one is unwilling to contravene widespread judgments), these studies constitute a strong *prima facie* case against neo-Ryleanism. For in such a case, the vignettes we employ should be understood as standard philosophical counterexamples to anti-intellectualism and praxism.

We begin, in Sect. 2, with a discussion of anti-intellectualism. In Sect. 3, we consider praxism. In Sect. 4, we make a *prima facie* case for a particular version of radical intellectualism.

## 2 Anti-intellectualism

Traditionally, anti-intellectualism is formulated as the positive thesis that  $x$  knows how to  $\psi$  only if  $x$  possesses a certain sort of ability to  $\psi$ .<sup>10</sup> Anti-intellectualists thus hold that there is no correct set of sufficient conditions for knowing how to  $\psi$  that does not invoke an ability to  $\psi$ .<sup>11</sup>

<sup>8</sup> See the quote from Noë in Sect. 2 for a vivid illustration of this claim.

<sup>9</sup> The charge of over-intellectualization is not unique to the present debate, but appears in a variety of contexts. For instance, it surfaces in discussions of the nature of emotion (Goldie 2000, p. 3), perceptual experience (Hurley 2001), perceptual entitlement (Burge 2003), and mental content (Chalmers 2006, pp. 63 and 76), to cite just a few recent examples.

<sup>10</sup> It is often said that the relevant sort of ability is a counterfactually supporting “complex of dispositions” (Ryle 1946, 1949, ch. 2; Hawley 2003; Noë 2005; cf. Stanley and Williamson 2001). Whether or not one accepts this view, it must be assumed that the relevant ability is *stable*, in the sense that one typically retains it even in inauspicious conditions—as when, e.g., one is asleep, nervous, inebriated, temporarily injured, and so on (Bengson and Moffett 2007). After all, one may be able to  $\psi$ , even though one is not able to  $\psi$  *right now* (because one is napping, say). In Sect. 3, we discuss the claim that the relevant ability must in addition be reliable.

<sup>11</sup> Anti-intellectualism is endorsed by Ryle (1946, 1949, ch. 2), Bechtel and Abrahamsen (1991, p. 152), Brandom (1994, p. 23), Braddon-Mitchell and Jackson (1996, p. 131), Haugeland (1998, p. 322), and Noë (2005). Cf. Hawley (2003) and Williams (forthcoming), who on one interpretation are anti-intellectualists who hold a counterfactual success account of ability.

One of the most forceful challenges to this thesis is that there appear to be counterexamples: some people (e.g., coaches, instructors, etc.) know how to do what they are not able to do themselves. Hence, Stanley and Williamson (2001, p. 416) report their judgment that a ski instructor may know how to perform complex ski stunts, yet be unable to perform them herself.<sup>12</sup> In a recent defense of anti-intellectualism, Noë suggests that Stanley and Williamson's judgment is not widely shared. He writes (2001, pp. 283–284):

Is it Stanley and Williamson's view that, if polled, most English speakers would share their intuition that the instructor is unable to do the jumps even though she knows how to do the jumps? I would predict that this is not true, or rather, that the outcome of such a poll would depend on how we tell the back-story. Consider: what could justify the judgment that the instructor knows how to do the jumps, if not her ability to perform them here and now? Not the fact that she is able to teach someone else to do the jumps, or the fact that she knows a lot about jumping.

In this passage, Noë makes the following empirical claim: most English speakers would not judge that the ski instructor both knows how to do the jumps and lacks the ability to do the jumps.<sup>13</sup> If Noë's prediction is correct, this would constitute a *prima facie* reason for thinking that those philosophers who endorse intellectualism have over-intellectualized know-how; conversely, if the prediction is incorrect, this is a *prima facie* reason for thinking that their rejection of anti-intellectualism is well-motivated.

In order to settle this issue, we tested Noë's prediction by giving 194 participants the following vignette:

Pat has been a ski instructor for 20 years, teaching people how to do complex ski stunts. He is in high demand as an instructor, since he is considered to be the best at what he does. Although an accomplished skier, he has never been able to do the stunts himself. Nonetheless, over the years he has taught many people how to do them well. In fact, a number of his students have won medals in international competitions and competed in the Olympic games.

Participants were asked both whether Pat knows how to perform the complex stunts and whether Pat is able to perform the complex stunts.<sup>14</sup> Because the vignette explicitly states that Pat has *never* been able to perform the stunts, the possibility of

<sup>12</sup> Stanley and Williamson credit Jeff King for this example.

<sup>13</sup> Noë (in personal communication) has suggested that there is an ambiguity in the expression 'knows how to' that may complicate matters. While we agree that the issues here are complicated, we do not find this particular suggestion plausible. Although there *may* be something to the idea, compatible with our conclusions, that the folk do not always distinguish between the varieties of knowledge how canvassed at the outset, the claim that 'knows how to' is ambiguous is a substantive linguistic hypothesis for which there appears to be no evidence. See below for discussion. For extended criticism of the ambiguity proposal, see Bengson and Moffett (2007, sec. 2).

<sup>14</sup> For both questions in this study, as well as the studies that follow, participants were given the following options: "definitely yes"; "probably yes"; "probably not"; "definitely not". These answers were collapsed into a dichotomous variable (1 = yes; 0 = no) for statistical analysis. The raw data for these studies is available at <http://www.uwo.edu/moffett/research/khdata.pdf>.

telling a “back-story” which could rationalize an ability-attribution (and, on that basis, a know-how attribution) is effectively ruled out. Since Noë holds that the folk will attribute know-how to Pat only if such a story is available, he would predict that in the present case the majority of participants would judge that Pat does not know how to perform the stunts. Contrary to Noë’s prediction, however, only a small minority of participants (7.2%) made this judgment. Despite the explicit no-ability information provided in the vignette, another small minority (11.3%) judged that Pat both knows how and is able. A binomial test showed that these results—considered both individually and jointly—were significantly below chance ( $p < .001$ ).<sup>15</sup> Contrary to anti-intellectualism, the vast majority (81%) judged both that Pat knows how to perform the stunts and that he is unable to do them. This result was significantly above chance ( $p < .001$ ), thus clearly disconfirming Noë’s prediction.

These findings stand in opposition to the charge of over-intellectualization. For they strongly suggest that, *contra* anti-intellectualism, ordinary judgments of know-how are not sensitive to the absence of ability.

In order to ensure that these findings were not due to an idiosyncrasy of the Pat case, we gave 190 participants in the same study an additional vignette:

Jane is an Olympic-caliber figure skater practicing a complex jump called the Salchow. When one performs a Salchow, one takes off from the back inside edge of one foot and lands on the back outside edge of the opposite foot after one or more rotations in the air. A single Salchow requires one complete rotation. A double requires two. A triple requires three. A quadruple requires four. And a quintuple requires five. Like virtually all Olympic skaters, Jane is consistently able to perform a triple Salchow. Although Jane can land a quadruple Salchow one out of every three attempts, she is unable to do a quintuple Salchow. In fact, at the present time, nobody is able to perform one. Nevertheless, Jane wants to be the first skater to ever land a quintuple Salchow and so she occasionally practices them in her free time. She knows that in order to do a quintuple Salchow, she must take off from the back inside edge of one foot and land on the back outside edge of the opposite foot after five complete rotations in the air. Whenever she attempts this, however, she cannot make it around the full number of rotations without falling.

Participants were asked both whether Jane knows how to do the quintuple Salchow and whether Jane is able to do the quintuple Salchow. Once again the vignette is stated in such a way that no back-story is available. So, anti-intellectualism would predict that the majority of participants would judge that Jane neither knows how nor is able. Contrary to this prediction, however, only a small minority of participants (11.6%) made this judgment. Despite the explicit no-ability information provided in the vignette, another small minority (11%) judged that Jane both knows how and is able. A binomial test showed that these results—considered both individually and jointly—were significantly below chance ( $p < .001$ ). Contrary to

<sup>15</sup> Here we use ‘significance’ as a technical term that denotes *statistical* significance. Throughout, we treat a given relation  $r$  as statistically significant if  $r$  possesses a  $p$  value of less than .001 ( $p < .001$ ), which means that there is more than a 99.9% chance that the relation is genuine (i.e., is true of the general relevant population, and not merely a peculiarity of the actual data sample).

anti-intellectualism, the vast majority (76%) judged both that Jane knows how to do the quintuple Salchow and that she is unable to do it. This result was significantly above chance ( $p < .001$ ).

These findings confirm that the results of the Pat case were not idiosyncratic: the folk are perfectly comfortable attributing know-how in the absence of ability. Consequently, they pose a significant challenge to a charge of over-intellectualization: *contra* anti-intellectualism, ordinary judgments of know-how appear to be insensitive to the absence of ability. By contrast, since Jane possesses propositional knowledge regarding the activity which she is judged to know how to perform (she “knows that in order to do a quintuple Salchow, she must....”), these findings support intellectualism.<sup>16</sup> For they suggest that ordinary judgments of know-how are sensitive to the presence of a certain sort of propositional knowledge.

Of course, there is a possible alternative interpretation of these results. According to this alternative, what our results show is that while most English speakers use ‘knows how to’ to express a broadly intellectualist concept, a small number use it to express a broadly anti-intellectualist concept. On this view, which we will call the *diversity hypothesis*, the debate between the two philosophical camps is grounded in a semantic disagreement (cf. Sosa 2007; Nichols and Ulatowski 2007).

Although it might sometimes be reasonable to interpret response diversity as a consequence of semantic disagreement, there are a number of reasons to reject the diversity hypothesis in this particular case. First, it is committed to a substantive linguistic hypothesis that conflicts with the linguistic evidence. In particular, it is doubtful that the English expression ‘knows how to’ expresses multiple non-equivalent concepts, since it consistently fails semantic tests for ambiguity and related phenomena. Because to our knowledge all such tests deliver the same result, we will consider only two here.

The first involves VP deletion (Zwicky and Sadock 1975, p. 19), as in:

- (1) I didn’t see her duck, but Jane did.

This sentence has a grammatically anomalous reading on which the deleted VP is not anaphoric on the antecedent VP; the availability of this reading is due to the fact that (1) contains an ambiguous expression (‘duck’). Now, contrast (1) with the following sentence, which does not admit of a grammatically anomalous reading:

- (2) I don’t know how to do a quintuple salchow, but Jane does.

Another well-established test involves eliciting potential contradictions (Zwicky and Sadock 1975, pp. 7–8). Consider:

- (3) Jane deposited her check in the bank, but she did not deposit her check in the bank.

Clearly (3) has an ordinary reading on which it is not contradictory, indicating that the term in question (‘bank’) expresses multiple non-equivalent concepts. On the

<sup>16</sup> Indeed, Jane possesses precisely the sort of propositional knowledge that is invoked by many of the intellectualists cited in note 7. Specifically, Jane knows that taking off from the back inside edge of one foot and landing on the back outside edge of the opposite foot after five complete rotations in the air is a way of doing a quintuple Salchow.

other hand, there is no ordinary reading of the following sentence on which it is not contradictory:

- (4) \* Jane knows how to do a quintuple Salchow, but she doesn't know how to do one.

Tests such as these indicate that the English expression 'knows how to' does not express multiple non-equivalent concepts.<sup>17</sup>

There is another, perhaps more pressing, reason to reject the diversity hypothesis: to wit, it is not well-supported by our data. For given, first, how strongly this data favors the intellectualist position and, second, Burge's (1979) widely accepted arguments for anti-individualism, it seems more natural to attribute the minority anti-intellectualist responses to some form of misunderstanding.

One potential source of misunderstanding is that frequently our primary evidence that someone knows how to  $\psi$  is that they are able to  $\psi$ . As a result, the stereotypical individual who knows how to  $\psi$  is, in addition, able to  $\psi$ . This suggests that know-how attributions will stereotypically implicate the corresponding ability attributions.<sup>18</sup> As is well known, ordinary speakers frequently treat generalized conversational implicatures as entailments.<sup>19</sup> Consequently, it is unsurprising that some participants made judgments in which know-how tracked ability.

Other potential sources of misunderstanding or error include standard Burgean phenomena (e.g., associated misconceptions), inattentiveness,<sup>20</sup> and so on. Whatever the source, the general point should be clear: it is unnecessary to appeal to semantic disagreement in order to account for the minority anti-intellectualist responses in the Pat and Jane cases. Unless positing such disagreement is necessary, we believe that it is best avoided. Indeed, although it might sometimes be reasonable to interpret response diversity as a consequence of semantic disagreement, there is also a real

<sup>17</sup> Incidentally, the preceding tests would remain appropriate even if the alleged second reading of 'knows how to' was used by only a minority of English speakers, for in such a case the second reading would nevertheless still be available. Now, the diversity hypothesis may be developed either as an ambiguity thesis (broadly construed) or as a thesis concerning idiolectal variance within a population. The linguistic tests are intended to address the first approach. The second approach comes in two flavors, a weak and a strong version. According to the weak version, that which we call 'English' is simply a rough generalization over a few, select idiolects (English<sub>1</sub>, English<sub>2</sub>, etc.). For the reasons that follow, we believe that this sort of diversity hypothesis is not plausible in the present case. According to the strong version of the idiolectal variance approach, there is no such thing as a common, shared language; there are only individual, speaker-specific idiolects. This sort of view has its roots in the work of Chomsky (1986) and Davidson (1986). While we believe that this view is grounded in an implausible general theory of language, the relevant issues are simply too large to be dealt with in this context.

<sup>18</sup> See Levinson (2001). Roughly, stereotypical implicatures rely on the heuristic that what is simply described is stereotypically exemplified. Incidentally, we do not mean to downplay the significance of the connection between ability and know-how; getting this connection right is one of the most difficult challenges facing intellectualism. For a suggestion as to how this can be achieved, see note 28.

<sup>19</sup> As Soames (2002, p. 68) observes in a somewhat different context, "When ordinary speakers are asked what sentences mean, often they do not address themselves to the question of [semantic meaning]. Instead, they focus on what they would typically use the sentences to convey, or what information they would typically gather from assertive utterances of them."

<sup>20</sup> Over half of the minority anti-intellectualist responses involved judgments that Jane and Pat are able to perform their respective activities despite the fact that the vignettes explicitly state that they are not able.

danger for this strategy to degenerate into a variety of linguistic Humpty-Dumptyism.<sup>21</sup>

Nevertheless, even if it is in fact best to interpret our results as exposing a semantic disagreement, this does not significantly affect our overall conclusion. Our primary goal in this section is to make a *prima facie* case that there is a philosophically interesting ordinary language meaning of 'knows how to' which is appropriately analyzed in intellectualist terms, for this alone is sufficient to establish that intellectualism does not over-intellectualize. Because the diversity hypothesis effectively concedes this point, we will hereafter drop discussion of this alternative.

### 3 Praxism

We now turn to the second component of neo-Ryleanism. The simplest way of formulating praxism is as the thesis that if  $x$  has the ability to  $\psi$ , then  $x$  knows how to  $\psi$ . Thus formulated, praxists are committed to the claim that it is not the case that someone could both have the ability to  $\psi$  and simultaneously fail to know how to  $\psi$ .

As noted in Sect. 1, the rejection of praxism appears to be subject to the complaint of over-intellectualization to an even greater extent than intellectualism. This might explain praxism's widespread (though often inexplicit) acceptance: at first glance, it seems implausible to deny that one knows how to perform a certain activity if one is judged to possess the ability to perform that activity. Even Stanley and Williamson (2001), who are at pains to defend intellectualism and undermine neo-Ryleanism, do not challenge praxism. On the contrary, they report that they find praxism plausible (pp. 442–443).<sup>22</sup>

We tested whether folk judgments are consistent with praxism by giving 138 participants the following vignette, adapted from Hawley (2003):

Sally, who is an inexperienced hiker with extremely poor vision, decides to go snow shoeing through the mountains in February. As she is hiking along, an avalanche suddenly starts and a rush of snow sweeps down the mountain and over Sally. Sally, however, mistakenly takes the snow to be a body of water (she believes incorrectly that a nearby dam has broken) and so she responds

<sup>21</sup> There may be an additional, purely empirical reason to reject the diversity hypothesis in the present case. Presumably, a diversity hypothesis is plausible in a given case only if response diversity is consistent across the relevant population in that case. Since less than half of the participants who made broadly anti-intellectualist judgments did so in response to *both* the Pat and Jane vignettes, such consistency is lacking in the present case.

<sup>22</sup> At the same time, Stanley and Williamson accept the positive formulation of anti-praxism (viz., that  $x$  knows how to  $\psi$  only if  $x$  possesses a certain sort of propositional knowledge regarding  $\psi$ ), thus exploiting the gap between the negative and positive formulations. Their discussion suggests a view of know-how which combines intellectualism and praxism. However, it seems possible to give a uniform (non-disjunctive) intellectualist-praxist analysis of know-how only by forging a dubious link between ability and propositional knowledge. For in order to avoid the disjunctive thesis that  $x$  knows how to  $\psi$  if *either*  $x$  possesses a certain sort of ability to  $\psi$  *or*  $x$  possesses a certain sort of propositional knowledge regarding  $\psi$ , one must hold the *prima facie* implausible view that possession of the relevant ability to  $\psi$  is sufficient for possession of the relevant propositional knowledge regarding  $\psi$ , or conversely. The cases described in this section, if accepted, constitute counterexamples to this view, for the subjects in these cases have the relevant abilities but lack the requisite propositional knowledge.

by making rapid swimming motions. Sally aims to swim through the water towards the surface. Though Sally has never heard of this fact before, making swimming motions is a way to escape avalanches. As a result of her lucky mistake, Sally is able to escape from the avalanche.

Participants were asked both whether Sally knows how to escape avalanches and whether Sally is able to escape avalanches. Given the explicit ability information provided by the vignette, praxism would predict that participants would attribute both ability and know-how to Sally. Contrary to this prediction, only a small minority of participants (12%) judged that Sally both knows how and is able. Another small minority (12%) judged that Sally neither knows how nor is able. A binomial test showed that these results—considered both individually and jointly—were significantly below chance ( $p < .001$ ). Contrary to praxism, the vast majority (76%) judged both that Sally is able to escape avalanches and that she does not know how to escape them. This result was significantly above chance ( $p < .001$ ), thus clearly disconfirming the praxist's prediction.

These findings stand in opposition to a charge of over-intellectualization. For they strongly suggest that, *contra* praxism, ordinary judgments of know-how are not sensitive to the presence of ability. By contrast, since Sally lacks propositional knowledge regarding the activity which she is judged to not know how to perform (she “has never heard” of the relevant fact), these findings support anti-praxism.<sup>23</sup> For they suggest that ordinary judgments of know-how are sensitive to the absence of a certain sort of propositional knowledge.

At this point we must introduce a complication arising from disagreement among praxists. Some praxists deny that ability entails know-how in cases of “accidental success” (Hawley 2003), and thus would explain the above results as a consequence of the apparent unreliability of Sally's ability. According to such praxists, if  $x$  is *reliably* able to  $\psi$ , then  $x$  knows how to  $\psi$ .<sup>24</sup> Presumably, proponents of this refined praxism would acknowledge that ordinary judgments of know-how are not sensitive to the presence of mere ability; rather, they would hold that such judgments are sensitive to the presence of *reliable* ability.<sup>25</sup>

<sup>23</sup> Indeed, Sally lacks precisely the sort of propositional knowledge which many anti-praxists hold to be necessary for know-how. Specifically, Sally lacks knowledge that making swimming motions is a way to escape avalanches.

<sup>24</sup> This version of praxism is evidently endorsed by Brandom (1994), Braddon-Mitchell and Jackson (1996), Haugeland (1998), Noë (2005), and Hetherington (2005). Cf. Hawley (2003) and Williams (forthcoming). Snowdon (2004) and Bengson and Moffett (2007, unpublished manuscript) endorse varieties of anti-praxism. Stanley and Williamson (2001), Braun (2006), and Brogaard (forthcoming) endorse (at least) the positive formulation of anti-praxism.

<sup>25</sup> We believe that the issues here are far subtler than this lets on. Suppose that Sally's ability to escape avalanches is reliable: whenever there is an avalanche, she makes the requisite swimming motions and thereby escapes. This would not be enough to qualify her as knowing how to escape avalanches. In order for Sally's reliable ability to making swimming motions to qualify her as knowing how to escape avalanches, this reliable ability must be underwritten by something related to escaping avalanches. The natural thing to invoke here is *knowledge that making swimming motions is a way to escape avalanches*. But if such propositional knowledge is required, the appeal to reliable abilities buys the praxist nothing. Though we think this point is quite important, since our primary concern in this section is to test the empirical claim that ordinary judgments of know-how are sensitive to the presence of ability, we will not pursue it further here.

In order to test whether folk judgments are consistent with this refined version of praxism, we gave 138 participants in the same study an additional vignette, adapted from Bengson and Moffett (2007):

Irina, who is a novice figure skater, decides to try a complex jump called the Salchow. When one performs a Salchow, one takes off from the *back inside* edge of one skate and lands on the *back outside* edge of the opposite skate after one or more rotations in the air. Irina, however, is seriously mistaken about how to perform a Salchow. She believes incorrectly that the way to perform a Salchow is to take off from the *front outside* edge of one skate, jump in the air, spin, and land on the *front inside* edge of the other skate. However, Irina has a severe neurological abnormality that makes her act in ways that differ dramatically from how she actually thinks she is acting. So, despite the fact that she is seriously mistaken about how to perform a Salchow, whenever she actually attempts to do a Salchow (in accordance with her misconceptions) the abnormality causes Irina to unknowingly perform the correct sequence of moves, and so she ends up successfully performing a Salchow.

Participants were asked both whether Irina knows how to do the Salchow and whether Irina is able to do the Salchow. Since the vignette explicitly states that Irina successfully performs a Salchow whenever she attempts to do one, it is clear that Irina is reliably able to do a Salchow. So, praxism would predict that participants would attribute know-how to Irina. Contrary to this prediction, however, only a small minority of participants (12%) made this judgment. Another very small minority (1%) judged that Irina neither knows how nor is able. A binomial test showed that these results—considered both individually and jointly—were significantly below chance ( $p < .001$ ). Contrary to refined praxism, the vast majority (86%) judged both that Irina is able to do the Salchow and that she does not know how to do it. This result was significantly above chance ( $p < .001$ ).

These findings stand in stark opposition to a charge of over-intellectualization: *contra* refined praxism, ordinary judgments of know-how appear to be insensitive to the presence of reliable ability. By contrast, since Irina lacks propositional knowledge regarding the activity which she is judged to not know how to perform (she “is seriously mistaken about how to perform a Salchow”), these findings support anti-praxism.<sup>26</sup> For they suggest that ordinary judgments of know-how are sensitive to the absence of a certain sort of propositional knowledge.<sup>27</sup>

What, then, explains the *prima facie* plausibility of praxism? We suggest that the appeal of praxism may be the result of a confusion between our typical epistemic grounds for attributing know-how to an individual and the actual metaphysical basis for that attribution. There is no question that for a wide range of cognitive agents in

<sup>26</sup> Once more, Irina lacks precisely the sort of propositional knowledge which many anti-praxists hold to be necessary for know-how. Specifically, Irina lacks knowledge that taking off from the back inside edge of one foot and landing on the back outside edge of the opposite foot after five complete rotations in the air is a way of doing a quintuple Salchow.

<sup>27</sup> An alternative explanation is that our studies expose a semantic disagreement between those who use ‘knows how to’ to express a broadly anti-praxist concept and those who do not. The comments on the diversity hypothesis considered at the end of Sect. 2 apply *mutatis mutandis* here.

a wide range of circumstances, the fact that an agent is (reliably) able to  $\psi$  is adequate grounds for believing that the agent knows how to  $\psi$ . Cases like the one involving Irina are sufficiently rare that they can be safely ignored in most circumstances. Notice, in fact, that in the Irina case we would be justified, though mistaken, in believing that Irina knows how to do a Salchow unless we were apprised of her misconceptions. But when so apprised, it becomes evident that the know-how attribution is misplaced, although the ability attribution remains appropriate. In such cases, concrete-case judgments diverge from what praxism predicts. Indeed, as our results make clear, even when the relevant ability is extremely reliable, the folk are perfectly comfortable withholding attributions of know-how in the presence of ability.

#### 4 Radical intellectualism

While we believe that the sorts of experimental results presented here must be treated with care in a philosophical setting, the present findings go decisively against both anti-intellectualism and praxism. More generally, they provide evidence that the folk are not neo-Ryleans.

Given that this sort of experimental philosophy merely provides a *prima facie* assessment of the status of unreflective folk judgments, these results do not, of course, establish the falsity of neo-Ryleanism. However, to the extent that one's considered judgments about the vignettes agree with those of the majority of our participants (or to the extent that one is unwilling to contravene such widespread judgments), the vignettes constitute a strong *prima facie* case against that view. So construed, the vignettes in Sect. 2 serve as standard philosophical counterexamples to the claim that the ability to  $\psi$  is necessary for knowing how to  $\psi$ , as anti-intellectualists traditionally maintain, and the vignettes in Sect. 3 to the claim that a (reliable) ability to  $\psi$  is sufficient for knowing how to  $\psi$ , as praxists maintain.

Understood as counterexamples to the two conjuncts of neo-Ryleanism, these vignettes serve to lend substantial plausibility to radical intellectualism. What more is needed over and above such counterexamples for a defense of radical intellectualism is a plausible philosophical articulation of that position. While this is not the place to give a full exposition and defense, we will close by sketching our own radical intellectualist view (see also Bengson and Moffett 2007, unpublished manuscript).

On this view, know-how is intimately tied to *understanding a way of  $\psi$ -ing*, where this involves reasonable mastery of various associated concepts.<sup>28</sup> Presumably, Pat understands a way of performing the stunts and Jane understands a way of performing the Salchow, and that is why both are judged to know how. On the other hand, neither Sally nor Irina understands what she is doing, and that is why both are

<sup>28</sup> Of course, the concepts in question might be demonstrative and proprioceptive (e.g., doing *this*). This enables us to account for the stereotypical connection between know-how and ability observed in Sect. 2. In short, reasonable mastery of such concepts may be achieved most easily—and, in certain cases, perhaps even only—via action. Consider: most of us are acquainted with the phenomenon of practicing a certain motor skill, such as swinging a golf club, until at some point we perform it correctly and suddenly “just get it”. In such a case, we come to see (know, understand) that it's done like *this*.

judged to not know how. We believe that the most satisfactory way of accommodating these judgments in an analysis of know-how is as follows:<sup>29</sup>

$x$  knows how to  $\psi$  if and only if for some way  $w$  of  $\psi$ -ing

- i.  $x$  knows  $w$ ,
- ii.  $x$  knows that  $w$  is a way of  $\psi$ -ing, and
- iii.  $x$  minimally understands  $w$ ,<sup>30</sup>

where  $x$  minimally understands  $w$  if and only if  $x$  has a correct and complete, though possibly implicit, conception  $\xi$  of  $w$  and  $x$  has reasonable mastery of the concepts in  $\xi$ .<sup>31</sup> Since a (reliable) ability to  $\psi$  is on this view neither necessary nor sufficient for understanding  $\psi$ , it comes as no surprise that normal, competent speakers of the language tend to make concrete-case judgments that track radical intellectualism rather than neo-Ryleanism.

In our studies, we elicited folk judgments about cases of putative *human* know-how. We did not ask the folk about cases of putative non-human *animal* know-how. Why not? More generally, what do we, as radical intellectualists, say about animal know-how? Our answer is simple. We believe that the status of animal know-how is best left to experts on animal cognition. Although there will no doubt be some relatively clear cases—e.g., chimpanzees know how to extract termites from their nests—we think that most cases should be decided by the best explanatory theory of animal behavior. In those cases where attributions of know-how are scientifically indispensable, we are comfortable with the corresponding attributions of propositional knowledge and minimal understanding. After all, it is consistent with both ordinary usage and work in contemporary cognitive ethology (Allen and Bekoff 1997) that animals across a wide range of taxa possess mental states, including (conceptually laden) propositional attitudes.<sup>32</sup>

<sup>29</sup> Note that clause (ii) of the following proposal invokes precisely the sort of propositional knowledge to which folk judgments about know-how appear to be sensitive. See notes 16, 23, and 26.

<sup>30</sup> Allowing that the understanding in question may be implicit. We believe that clauses (ii) and (iii) together entail clause (i), objectual knowledge of a way to  $\psi$  (cf. 'Martin knows a great way to impress his colleagues'). We leave clause (i) only for the sake of perspicuity. In Bengson and Moffett (2007), JB and MM observe that clause (ii) does not entail clause (iii) because one might satisfy (ii) but significantly misunderstand the concepts in the relevant proposition, a la Burge's arthritis patient (1979). Hence the need for clause (iii). In addition, clause (iii) helps to distinguish knowledge how to  $\psi$  from the various other sorts of knowledge how canvassed at the outset: in short, only knowledge how to  $\psi$  requires a minimal understanding of a way of  $\psi$ -ing. This idea is developed in Bengson and Moffett (unpublished manuscript).

<sup>31</sup> Roughly,  $x$  has reasonable mastery of a concept  $C$  if and only if  $x$  is able to employ  $C$  correctly in core cases (under normal cognitive conditions). Generally speaking, the core cases are those in which a general failure to employ the concept correctly implies that the subject at most *merely* possesses the concept. For discussion of mere concept possession, see especially Burge (1979).

<sup>32</sup> It should be clear that our deference to experts on animal cognition does not force us to admit the truth of any and all attributions of know-how by contemporary scientists. For instance, if cognitive scientists were to proclaim that the (subpersonal) visual system knows how to detect edges, they would be mistaken. (Perhaps the visual system is able to detect edges; but it certainly does not *know* how to do so.) It is also important to bear in mind that, *contra* Wallis (forthcoming), many attributions of know-how to cognitively unsophisticated animals, such as the caddis fly larvae, may in fact be ultimately scientifically dispensable. For, presumably, many such attributions can be replaced without loss by attributions of some sort of ability. We speculate that explaining the behavior of cognitively unsophisticated animals will *at most* require attributing so-called 'procedural knowledge', which is importantly distinct from know-how, as many cognitive scientists recognize (Stillings et al. 1995, p. 396).

We have seen that neo-Ryleanism does not provide an empirically adequate explanation of folk judgments about know-how, since such judgments diverge significantly from attributions of ability. What, then, is the correct explanation of these judgments? Our version of radical intellectualism suggests that a complete explanation will invoke the connection between know-how and understanding. To test whether the connection between know-how and understanding is in fact the key to an empirically adequate explanation of folk judgments about know-how, we asked participants in the studies discussed in Sects. 2 and 3 whether each of the actors *understands* how to perform his/her respective activity. In all four cases, the vast majority of participants made judgments in which know-how significantly tracked understanding (Pat:  $\rho = .20$ ,  $p < .001$ ; Jane:  $\rho = .25$ ,  $p < .001$ ; Sally:  $\rho = .20$ ,  $p < .001$ ; Irina:  $\rho = .33$ ,  $p < .001$ ).<sup>33</sup>

While these findings are perfectly consonant with our preferred version of radical intellectualism, they appear to be unintelligible from the point of view of neo-Ryleanism. Accordingly, our studies persuade us that the charge that the rejection of neo-Ryleanism over-intellectualizes know-how is baseless. To the contrary, they provide *prima facie* reason to think that there exists a set of correct necessary and sufficient conditions for knowing how to  $\psi$  that does not in any way invoke the ability to  $\psi$ , just as radical intellectualists maintain.

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<sup>33</sup> In other words, the folk's judgments regarding know-how and understanding were significantly correlated. Given this, it appears reasonable to conjecture that some notion of understanding will be an ineliminable constituent of an analysis of know-how, as in our preferred version of radical intellectualism. In Bengson and Moffett (2007, unpublished manuscript), JB and MM provide primarily a priori arguments for precisely this conclusion.

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