

Knowing How is Knowing How You Are (or Could Have Been) Able*

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Know how and ability have a seemingly fraught relationship. Clearly there is *some* connection. Know how guides skilled, intentional action: when a champion pole vaulter clears the bar, they employ their particular know how. And ability is arguably a prerequisite for skilled, intentional action: clearing the bar *intentionally* is a good indicator of the athlete's abilities. Even so, there are many well-known cases where an agent knows how to do something, while lacking the ability. What then *is* the relationship then between the two? Perhaps ability is a mere fickle friend to know how.

I deepen this tension by arguing for two new pieces of data. First, know how ascriptions have two distinct readings that differ in their entailments to ability: one entails ability, the other does not. Second, the indeterminacy of certain ability claims, independently motivated by Mandelkern et al. (2016) and Boylan (forthcoming), infects both readings of know how claims.

No existing accounts capture both of these data points, I argue; but a kind of intellectualism about know how has special resources to account for them. Ascriptions of knowledge of *infinitival* questions give rise to a special kind of context-sensitivity: in some contexts they express questions about what I call one's *indicative* abilities, in others one's *subjunctive* abilities. I show this kind of context-sensitivity is *sui generis* and specific to

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infinitives. I consider an intellectualist view where, very roughly, knowing how to do something is knowing an answer to an infinitival question about your abilities; I show how this view accounts for the relationship between know how and ability.

1 The Connection Between Know How and Ability

1.1 Two Readings

We can illustrate the two readings with some famous cases taken to break the entailment from know how to ability.¹ Stanley and Williamson (2001) say that in the following kind of example, an agent loses an ability but not the corresponding know how:²

The Injured Pianist. Rachmaninov breaks the little finger on his right hand in a way that results in permanent damage and loss of agility. He retains perfect memory of how he used to play his Third Piano Concerto, but can no longer perform various runs that are central to the piece in the way that he used to. While he knows there are ways to play the runs with just four fingers, he never learned to play the relevant passages that way.

Both of the following are true:

- (1) Rachmaninov knows how to play his Third Piano Concerto.
- (2) Rachmaninov is not able to play his Third Piano Concerto.

So, it is claimed, know how does not entail ability.

¹Here I build on some observations from Hawley (2003). But I take my claim, *Two Readings*, to go beyond Hawley's discussion. She does not address the question of ability entailments; the data point about the *differing* entailments of these readings is, I think, the important contribution above.

²See Ginet (1975), Carr (1979) and Snowdon (2004) for further examples. Stanley and Williamson's example is more extreme: the pianist loses both hands. I believe similar variations can bring out the possible false readings in those cases too. However, as a referee points out, the resulting cases are quite outre.

There are also agents with know how who have *never* had the corresponding ability. Stanley and Williamson (2001) report the following case from Jeff King:

The Armchair Ski Instructor. Alice the ski-instructor is a perfect teacher: she knows exactly what actions to instruct her students to do for them to ski. However, she cannot perform those actions in that sequence herself.

Again, the following seem true:

- (3) Alice knows how to ski.
- (4) Alice is not able to ski.

So again, it is claimed, know how does not entail ability.³

But with only slight alterations to the case, we can make the true know how claims turn false. Consider:

The Injured Pianist's Concert Tour. Rachmaninov's condition is as before. With his tour due to start in a month, he needs to

³A reviewer suggest the reply that Alice does not know how to ski but rather only knows how to *teach* skiing. But this struggles to explain why we *simultaneously* count Alice and others, who don't know how to teach, as knowing how to ski. Imagine a world class skier, Jean-Claude Killy, who is now too old to ski and no longer is able to do so. Just as with Rachmaninov, I judge that, in some sense, Killy still knows how. But further, we can imagine that Killy is terrible at articulating his skill; suppose he has *never* succeeded in explaining to anyone how he was able to ski so well. Killy does not know how to teach people how to ski.

My judgement here is that we can say that Alice and Killy *both* know how to ski. To bring this out, we could even suppose that Alice has extensively studied Killy's techniques by watching hours of his races and instructs people to ski using exactly some techniques pioneered by Killy. Perhaps they are both looking at one and the same slope, accurately thinking through the different things that would need to be done to ski it, Killy by imagining how he would move his body and Alice by thinking through the footage she watched of Killy skiing on similar slopes. I submit we should think that the following is true:

- (i) Alice and Killy know how to ski that slope.

It's not obvious how to account for this on the teachability strategy. It cannot be true on its literal meaning: we are supposing Alice does not in fact know how to ski. But it also cannot be true on the proposed "knows how to teach" reading: Alice knows how to teach skiing but Killy doesn't.

decide whether to change the concert program. He is struggling with the challenging runs of his concerto: while he knows that it is possible, he has failed to figure out how to play them with his four fingers. He has, however, mastered a selection of his Preludes, which he also regularly used to perform before the accident.

In the light of this variation, consider:

- (1) Rachmaninov knows how to play his Third Piano Concerto.

To my ears, this claim now sounds considerably worse. I would want to say:

- (5) Rachmaninov only knows how to play the Preludes and not the Concerto.

We can consider one final variation on the case to drive the point home. Suppose that, after many, many months of practicing with four fingers, Rachmaninov can now successfully play the runs in his concerto with four fingers. We could describe his success in this way:⁴

- (6) Rachmaninov *relearned* how to play his Third Piano Concerto.

It would be mysterious what this meant, if he unequivocally knew how to play the concerto all along. If there is *no* sense in which he didn't know how to play the Concerto, then what did he learn to do? And why did he have to *relearn* it?

We can make similar changes to the ski instructor case. Suppose as an experiment Alice decides to take to the slopes herself. We watch her make blunder after blunder, struggling to implement her own advice to her students. Consider again:

- (7) Alice knows how to ski.

⁴Notice people are similarly described as "relearning" how to walk, after suffering from ailments like strokes.

This seems faintly ridiculous while we watch her repeatedly fall on her face: in some important sense she *doesn't* know how to ski! And again, we can drive the point home by appeal to intuitions about learning; we could say:

(8) Alice is figuring out how to ski.

I invite you to think of other cases with this structure; I claim the same pattern as above will emerge. This is good evidence for the following:⁵

Two Readings. Know how claims have two distinct readings, one which entails an ability claim and another which does not.

1.2 Indeterminacy

My second data point is that know how claims share in the characteristic *indeterminacy* of ability claims.

I say a sentence is *indeterminate* when neither it nor its negation is clearly true in a scenario, even when we know all the relevant facts there. I leave open whether this indeterminacy is *semantic*, *metaphysical* or even *epistemic*. What matters is the distinctive *projection* behaviour of indeterminacy under negation: when ϕ is indeterminate, so is $\neg\phi$.

Mandelkern et al. (2016) and Boylan (forthcoming) have argued that indeterminacy is characteristic of certain ability claims. Returning to *Dartboard*, let's think about Carol's abilities instead. Neither of these claims are clearly true:

(9) Carol is able to hit the dartboard.

(10) Carol is not able to hit the dartboard.

(9) is not true because ability requires more than mere physical possibility. (9) requires it be in Carol's control to do hit the board. But it isn't — she

⁵Note that, as a consequence, I also reject what Cath (2020) calls "the growing consensus" that one knows how to *A* just in case one is able to *A intentionally*.

could easily fail upon trying. (10) is not true either because *can't* entails *won't*. Consider:

- (11) #Carol cannot/isn't able to hit the dartboard but she will.
- (12) #Carol cannot/isn't able to hit the dartboard but she might.

Both claims are defective. But in *Dartboard* Carol might well hit the top of the board. So, since *can't* entails *won't*, it cannot be determinate that she isn't able to.

Now let's return to know how. Take the following case:

Unreliable Dartboard. Carol has no special talent at darts. When stood an ordinary distance away, half of the time she hits the dartboard when she tries; half the time she misses completely.

What does Carol know how to do? Consider:

- (13) Carol knows how to hit the dartboard.
- (14) Carol doesn't know how to hit the dartboard.

Neither seem appropriate. Both seem either to *over-* or *underrate* Carol's dart-playing prowess.

This applies to both of the readings I isolated in the previous section. To see this, consider:

Injured Dartboard. Before she can make any improvements in playing darts, Carol loses her hands in a terrible accident.

In this case, (13) and (14) *remain* indeterminate — since it was indeterminate whether she knew how before the accident, she counts neither as clearly knowing how nor clearly not knowing how afterwards.

Summing up, we have as a second piece of data:

Indeterminacy. Both readings of know how claims can share the indeterminacy of ability claims.

2 Against Existing Explanations

My two data points pull against each other. *Two Readings* suggests variation in the relationship between know how and ability: some ways of understanding know how entail ability, others do not. *Indeterminacy* pulls the other way: since *both* readings of know how claims can be indeterminate, this suggests there is always *some* connection to ability. In this section, I argue no existing views, intellectualist or anti-intellectualist, resolve this tension.

2.1 The Basic Tension

To bring out the basic issues raised by my data, I first consider how some simple intellectualist and anti-intellectualist views might handle them.

What is the relationship between knowing how and propositional knowledge? *Intellectualists* argue that know how just is propositional knowledge: for instance, knowing how to ride a bike just is knowing some proposition about bike riding (though perhaps in a special way). *Anti-intellectualists* argue that know how is *not* reducible to knowing that.

This is closely connected to, but not exactly the same as, the question of what kinds of things are the *relata* of know how attributions. Intellectualists are required to say that know how attributions describe relations to *propositions* (or *sets of propositions*); anti-intellectualists tend to think that know how attributions describe relations to *actions*. Call these views *propositionalism* and *non-propositionalism* about know how, respectively.⁶ Intellectualism entails propositionalism, but, as Glick (2011) observes, anti-intellectualism does not entail non-propositionalism: there is a long tradition, for instance, as treating ability ascriptions as describing a relation between an agent and

⁶This is close to what Glick (2011) calls *weak intellectualism*. Glick describes weak intellectualism as the view that "know how is knowledge that has a proposition as a relatum"; it is contrasted with strong intellectualism, the view that know how is "theoretical knowledge", where theoretical knowledge requires at least belief and justification and may also require "being Gettierizable, being linguistically accessible, having its content available for use in reasoning, or being plastic in application". Propositionalism is not quite the same thing as weak intellectualism: propositionalism is compatible with know how not being any kind of attitude at all. But the spirit of the view is, I take it, close to the spirit of weak intellectualism.

the proposition that they perform a certain action.⁷ I aim to argue for full-blown intellectualism, not just propositionalism; but I will set aside mere propositionalism until section 5.

Stanley and Williamson (2001) provide the canonical version of intellectualism about know how. They say one knows how to A just in case one knows of some way that it is a way for them to A ; and that knowledge must be under a practical mode of presentation:

- (15) $\llbracket S \text{ knows how to } A \rrbracket^w = 1$ iff in w there's some way W for S to A s.t. S knows, under a practical mode of presentation, that W is a way for S to A .

This view does not explain *Two Readings*. Stanley and Williamson insist that, on their understanding, there can be a way for you to do something, even when you are not able to do it. This captures the true readings of know how descriptions in *The Injured Pianist* and *The Armchair Ski Instructor*: Rachmaninov knows how to play his piano concerto because there is still a *way* for him to do so; Alice the ski instructor knows how to ski because there is a way for her to do so. But then it is mysterious why there should also be *false* readings of know how ascriptions in these cases: after all, to say that Rachmaninov and Alice do know how, they claim that ways do not guarantee ability. And of course we still have a dilemma, if we revise the relationship between ways and ability. Suppose there can be a way for you do to something only when you are able to do it. Now we correctly predict the false readings of know how claims, but not the true ones.⁸

The view also struggles with *Indeterminacy*. Return to *Dartboard*. Here there determinately *is* a way for Carol to hit the dartboard: there is a certain sequence of motions that will lead to her hitting the dartboard. Carol just doesn't yet know, under the right guise, which way that is. This predicts

⁷See, for instance, the *stit* tradition, developed by Horty and Belnap (1995) and others.

⁸At this point, we might wonder practical modes of presentation can be help. But they face the same dilemma: either knowing the proposition W is a way to do A under a practical mode of presentation entails ability or it doesn't; either way, one reading is unaccounted for.

both know how ascriptions (13) and (14) are perfectly determinate. (13) is false, because, while there is a way for Carol to hit the dartboard, Carol does not know of any given way that *that* is a way for her to do so; (14) is true because (13) is false.

Turn now to anti-intellectualism. Anti-intellectualism, strictly speaking, is a negative thesis, that know how does *not* reduce to knowing-that. However, most anti-intellectualists are driven by the idea that know how is a kind of *capacity*. Some identify know how with a certain kind of ability: following Lewis (1990), know how could simply be the ability to do *A* itself; or it could be a more complex ability involving *A*, such as the ability to do *A* under normative guidance or the ability to answer questions about *A*.⁹ Other anti-intellectualists identify know how with a kind of disposition to do *A*.¹⁰ To illustrate the basic difficulties, I run my arguments on simpler forms of the view, where know how is either just the ability to do *A* or a disposition to do *A*; but these difficulties extend to other anti-intellectualisms too.

The simple ability view only partially predicts *Indeterminacy*.¹¹ On that view, know how just *is* ability; and so know how will surely be indeterminate in cases like *Unreliable Dartboard*. But it does not explain why in *Injured Dartboard* it's still indeterminate whether Carol knows how to hit the dartboard. After all, she determinately cannot hit the dartboard.

Anti-intellectualism struggles also with *Two Readings*. This is easy to see on the ability analysis. If know how just *is* ability, then all know how ascriptions must entail ability. So there cannot fail to be a reading of know how that does not entail ability.¹² This problem applies to dispositional views

⁹See, among others, Craig (1990), Wiggins (2012), Löwenstein (2017) and Habgood-Coote (2019) for views of this structure.

¹⁰See Setiya (2008, 2012) and Constantin (2018). Arguably Ryle (1949)'s own view also falls into this camp, as suggested by Weatherson (2006). Though note Kremer (2017) argues Ryle's actual view does not belong in either of the intellectualist or anti-intellectualist categories.

¹¹Whether this carries over to more sophisticated ability accounts depends on what such accounts say about the entailment from know how to ability.

¹²The objection is somewhat different for the more complex ability accounts mentioned above; but they will face the same dilemma as the disposition view.

too. Either the relevant disposition entails the ability to do A, or not; and in neither case do we predict *Two Readings*.

2.2 Contextualism about Ability?

At this point, intellectualists and anti-intellectualists alike might question my claim that there is *any* reading of know how which fails to entail an ability claim. For perhaps I simply have not looked hard enough. Ability claims are highly context-sensitive and give rise to a range of readings.¹³ Perhaps each know how claim is associated with a *particular* reading of ability; and once we isolate that reading, the entailment goes through. Not so, I argue: ordinary ability claims are not context-sensitive enough to rescue the entailment.

A first natural thought is to appeal to internal and external abilities. *Internal* ability is what one can do simply as a matter of one's *intrinsic* make-up; *external* ability is what one can do in one's *present circumstances*.¹⁴ Imagine a chef skilled at preparing ratatouille, but lacking the right ingredients: they have the internal ability to prepare the dish but lack the external ability. Many ability modals can express either reading, depending on the context.

Return to our cases. Perhaps Rachmaninov and Alice the ski-instructor simply lack *external* abilities, but retain *internal* abilities to play the piano or ski.¹⁵ I find this implausible — they lack the relevant abilities in *both* senses.

To see this, notice that natural language itself distinguishes these senses of ability. While “can” and “is able” give rise to a range of readings, the locution “has the ability” specifically tracks internal ability. We might say of our expert chef:

¹³To flag where my solution ultimately differs: I agree that context-sensitivity of ability will be important. But the context-sensitivity we will need *goes beyond* that of ordinary ability claims; I argue that the right context-sensitivity is distinctive of ascriptions of infinitival knowledge. Unlike the solution explored above, this is a distinctively intellectualist explanation of the data.

¹⁴I take the name of the former kind from Glick (2012).

¹⁵Glick (2012) has defended something like this claim, at least for Rachmaninov-style cases.

- (16) He is not able to make ratatouille — he doesn't have the ingredients.

But we would never say:

- (17) He does not have the ability to make ratatouille because he doesn't have the ingredients.

Internal abilities are not inhibited by such external circumstances. Now I submit that the following is simply false in *The Handless Pianist*:

- (18) Rachmaninov has the ability to play his Third Piano Concerto.

The same goes for Alice in *The Armchair Ski Instructor*:

- (19) Alice has the ability to ski.

A second kind of context-sensitivity comes from the distinction between specific and general abilities. My drunken friend is not able to drive their car in their current state. But this is not the norm: usually they're not drunk and so are able. Call the former, the ability to drive in these exact circumstances, the *specific* ability to drive and the latter, the ability to drive in normal circumstances, the *general* ability.

Do our agents have the relevant abilities in *normal circumstances*?¹⁶ This does look promising, for *The Injured Pianist* at least: being injured is abnormal. But this proposal exploits a non-essential feature of our case— that the absent ability is a normal one. What about when having a particular ability is *abnormal*? In such cases, a loss of this ability makes us *more* normal. Take a variation on the Rachmaninov style case:

The Gymnast. Frederica is already one of the strongest, most agile gymnasts alive. But she dreams of performing a feat that no body else has ever performed. She takes an experimental performance enhancing drug which boosts her strength and speed

¹⁶As mentioned above, it is natural to read Hawley (2003) as suggesting this strategy, in at least certain cases.

even further. While she is in this physical condition, she develops a brand new complicated, demanding version of the double back salto on the beam. Many try to imitate it but no one succeeds. Alas, the drug is soon discovered to have serious health effects and Frederica stops taking it. She returns to her normal, pre-drug state, wherein she is not able to perform her version of the double back salto.

Like in the Rachmaninov case, even when Frederica has stopped taking the drug, we can say:

- (20) Frederica still knows how to perform her version of the double back salto. (She just isn't able to anymore.)

To make it especially prominent, imagine another gymnast has started taking the performance-enhancing drug, in the hope of recreating Frederica's performance, and wants someone to teach her the routine. (20) sounds like exactly what the pianist wants to know. But it is certainly not true that Frederica is able to perform the routine in normal circumstances — her post-drug physique is what is normal for her and yet she cannot do it. *The Gymnast* is then a counterexample to the entailment from general know how to general ability.

Furthermore, lacking a certain ability might be neither normal *nor* abnormal. This is exactly the situation of Alice the ski instructor. Being able to ski is clearly not abnormal. But *not* being able to ski is not abnormal either — skiing is an ability acquired through hard work, not one that people necessarily have in normal circumstances. Thus it is simply not true that in *normal* circumstances, Alice is able to ski. Normal circumstances are compatible with various levels of skiing expertise, including none at all.

I see no grounds for further optimism here. Ability modals are indeed context-sensitive. Even still, one reading of a know how claim fails to entail *any* reading of an ordinary ability claim.¹⁷

¹⁷Following Hawley (2003), a final suggestion might be that in cases like *The Injured Pianist* ambiguity arises because the *activity* is underspecified. Rachmaninov knows how to

2.3 Knowing How *One* Does A

Another common move, when faced with cases like *The Injured Pianist* and *The Armchair Ski Instructor*, is to say that know how claims in fact are ambiguous. On one reading, the phrase “know how” talks about a distinctively practical state. This, particularly according to such anti-intellectualists as Brown (1970), Hornsby (2005) and Löwenstein (2017), is the philosophically interesting notion. But, they claim, there is also a second, completely separate reading of “knowing how” where one knows how to do *A* just in case they know how *one* does *A*. I’ll call this latter state *pseudo know how*.

This can save the entailment from know how, in the distinctive practical sense, to ability. When we attribute know how to Rachmaninov or Alice, we are in fact attributing propositional knowledge of how one plays the concerto or how one skis. This clearly does not entail ability, nor does it entail know how: knowing how *one* skis doesn’t mean *you* know how to do so.¹⁸

In fact, pseudo know how is neither necessary nor sufficient for what Alice and Rachmaninov have.^{19,20} Take necessity first. In fact, Rachmaninov was a giant of a man, and his enormous handspan made possible various techniques that are out of the question for most. The way *he* would play his concerto is very different from how a normal pianist would attempt it. Let’s suppose that the only way he knows how to play it is how *he specifically* would play it. None of this affects the truth-value of (1) as said in *The Injured Pianist*. But it *does* affect the truth of (21):

(21) Rachmaninov knows how *one* plays his Third Piano Concerto.

play the Concerto with all five fingers on each hand but not how to *play the Concerto without his little finger*. Hawley gives a fairly serious objection to this of her own. In addition, it’s not entirely clear how to apply this proposal to Alice the ski instructor. And, finally, this proposal struggles to capture the sense in which Rachmaninov *relearns* how to play the concerto: on Hawley’s account, no know how was either lost or gained.

¹⁸Note that intellectualists like Stanley (2011) exploit this move too.

¹⁹Bengson and Moffett (2011) also object to the sufficiency claim, but on rather different grounds.

²⁰I note as well that it does not seem particularly plausible to me that pseudo how is indeterminate in the variations of the dartboard case.

This is no longer clearly true, given the addition just made to the case — Rachmaninov’s knowledge is extremely specific to *him in particular*.

For sufficiency, consider the following variation on the ski instructor case:

The Physically Atypical Armchair Ski Instructor. Billie the ski-instructor, just like Alice, is a perfect teacher who cannot herself ski. But her unusual physique is extremely different from that of the average student, so much so that even if she were perform that sequence of actions, it would not result in *her* skiing; she would simply slip and fall.

The analogue of (3), our true claim about Alice the first instructor, doesn’t sound right here.

(22) Billie knows how to ski.

What Billie knows about skiing would never result in *her* skiing. Rather we would want to say:

(23) Billie knows how *one* skis.

(24) Billie knows how *you* ski.

But there should not be any difference on this strategy.

3 Context-Sensitivity in Infinitivals

The relationship between know how and ability is even more puzzling than previously thought. Know how claims have two readings, only one of which entails ability. But both readings maintain *some* connection to ability because of their potential indeterminacy.

To give a positive account of this, I will isolate a special feature of infinitival questions. I argue these questions give rise to an important and distinctive kind of context-sensitivity, one which will be central to my explanation of the data.

3.1 Infinitival questions

Intellectualists take know how to ascribe knowledge of a question.²¹ But not just any old question — specifically, an *infinitival* question. Such questions combine a question word with a verb in the infinitival form. Consider:

(25) John knows *who to call*.

(26) Alice asked *where to find them*.

The italicised expressions are infinitival questions.

Both have an essential modal element in their meaning. (25) says something like:

(27) John knows who he *can* call.

(26) says something like:

(28) Alice asked where she *should* find them.

No true paraphrase of claims like these will be modal-free. Since Bhatt (1999), a simple explanation has been widely accepted: (25) and (26) contain silent modal operators. Their real structure is something like:

(29) John knows who **CAN** to call.

(30) Alice asked where **SHOULD** to find them.

3.2 Motivating and characterising the indicative and subjunctive readings

I argue that infinitivals are subject to a novel kind of context-sensitivity — they can be read *indicatively* or *subjunctively*. To see this, start with a case:

Evening Newspaper. It's midnight. You approach me on the street and ask where to buy a newspaper. All the stores I know of are

²¹When the intended meaning is clear, I will be sloppy about distinguishing between a question and an interrogative sentence, which takes a question as its semantic value.

all shut. (But there may be others that I don't know about.)

There are two possible ways for me to answer your question. I could say:

- (31) I don't know where to buy a newspaper around here; all the stores I know of are shut.

This seems truthful — I can't advise you on where to get your newspaper. But surprisingly, the *opposite* answer also seems truthful:

- (32) Yes, I do know where to buy a newspaper around here; but unfortunately all the stores I know of are shut.

This is not specific to knowing where. Take knowing what. We can easily imagine a situation where either of the following are apt:

- (33) I don't know what to do.
(34) I *do* know what to do. The problem is *I can't do it*.

Or knowing who:

- (35) I don't know who to talk to.
(36) I do know who to talk to. The problem is that she is unavailable for the next week.

So there is context-sensitivity in ascribing knowledge of infinitival question. But where does it come from? The culprit, I think, is the silent modal. Modals are widely recognised to be context-sensitive — their meaning is partially determined by the information held fixed in the context. Following the work of Angelika Kratzer,²² we can capture this feature by interpreting a modal by using a *modal base f*. The modal base represents the information held fixed in the form of a set of worlds; this set restricts the possibilities a modal quantifies over. My claim is that in *Evening Newspaper*, and other cases like it, two possible modal bases are available in the con-

²²See Kratzer (1977, 1981, 1991).

text; one I will call *indicative* (and write f_i) and the other *subjunctive* (and write f_s).

What distinguishes these readings? The difference between the two is that, in general, the indicative holds all the facts fixed, whereas the subjunctive holds only a certain *subset* of the facts fixed.

Return to *Evening Newspaper*. In saying (31), I hold fixed the actual fact that the stores are closed; I say that given my *actual* circumstances, I don't know where to buy a newspaper. I call this reading *indicative*. In saying (32) on the other hand I quite clearly am not holding *everything* fixed in my utterance. The modal does not hold fixed the actual fact that the stores are closed; I could paraphrase what I said with:

(37) I know where you *could* buy a newspaper, if it weren't midnight.

But I do continue to hold a lot of other things fixed, like what stores there in fact are, which ones stock newspapers and so on. The reading in (32) holds some but not all of the actual facts fixed. For this reason, I call this reading a *subjunctive* reading.

The same relationship plays out in the various different cases of knowing what, where, and why infinitivals. We have an *indicative* reading, which holds fixed the actual facts; and a subjunctive reading which suspends some, but not all of the actual facts.²³

But what kinds of assumptions can the subjunctive reading suspend?

²³ A reviewer asks whether *whether*-infinitivals allow for indicative and subjunctive readings. It is not obvious to me that they do. Consider:

(i) ??John knows whether to turn right. He just can't.

In particular I find it hard here to get the subjunctive reading.

If that judgement is right, I conjecture that *whether*-infinitivals are constructed quite differently from *how*-infinitivals. A first important fact here is that, unlike *how*-, *when*- and *what*-infinitivals, *whether*-infinitival questions do not seem like they will involve syntactic movement: the question word remains in situ, in a *how*-infinitival. Second, Bhatt (1999) argues that there are in fact at least two kinds of infinitivals, distinguishing the kind of infinitival typically found in infinitival questions (and other environments) from *subject relative* infinitivals, such as the following:

(ii) The man *to fix the sink* is here.

Certainly facts about our environment. In *Evening Newspaper* it is midnight and the stores are closed. But the subjunctive reading in (32) clearly does not hold this fixed; for this reason exactly it gets to be true.

Crucially for know how, the subjunctive also can suspend assumptions about *our own physical constitution*. Consider:

The Hike. We are hiking and we need to find our way back to our campsite. Foolishly we have walked too far. I alone remember the route we took to this point; but that involves jumping a chasm and we are clearly too tired now to make it safely across. We also know that there is a shortcut back through the nearby forest, but neither of us know exactly where that path is.

Here I can say either of:

(38) I don't know where to go to make it back to the campsite. We'll never make it across the chasm.

(39) I do know where to go to make it back to the campsite. The problem is we're too tired to make the jump across the chasm.

(iii) The book *to be read for the seminar* is on the table.

The same kind of infinitive seems to be found in the modal *be* construction:

(iv) John is *to leave the building at once*.

On the basis of a number of arguments, Bhatt claims that subject relative infinitivals actually have a different semantics from other infinitivals. One argument is that, while they subject relatives have modal, it seems they must be understood as involving *necessity*; infinitival questions, it has been observed, can be understood as having the force of possibility. I would add a further argument for treating them different, namely that subject relative infinitivals do not seem to give rise to both indicative and subjunctive readings.

My conjecture then is that the *whether*-infinitival question is simply the question form of a sentence like (iv): "S knows whether to A" has the same semantics as "S knows whether S is to do A". In partial support of this, notice that English permits "knows to" constructions such as:

(v) John knows to leave the building at once.

These also plausibly involve subject relative infinitivals. I suggest the *knows whether to*-construction is simply the question form of the *knows to*-construction.

(38) is the familiar indicative reading. In (39), the subjunctive reading, the silent modal does not hold fixed our current physical conditions — it is (38) that does this and that claim is false for exactly this reason.

It does appear that the subjunctive holds fixed our *knowledge*: if a known fact remains fixed subjunctively, so too is the fact that we know it. We see this in *Evening Newspaper*: the subjunctive reading clearly holds fixed my knowledge of where the relevant stores are and what they sell. We also see this in *The Hike*: there we hold fixed that I know where exit A is. And the subjunctive reading does not appear to *add* assumptions about our knowledge: in *The Hike* there is *no* true reading of

(40) I know where to go to get to the forest path.

My last claim is that the subjunctive reading is not an instance of the more general context-sensitivity of modals, of the kind we saw in §2.2. The subjunctive reading is not accessible to modals in unembedded or indicative contexts. Return to (39) in *The Hike*. The covert modal must have the force of possibility; there are two ways to get out after all. But we cannot paraphrase this with a straightforward claim:

(41) I know where we can/are able to go to get back to the camp: we jump the chasm and follow the trail back.

This simply sounds false — if we tried to jump the chasm, we would fall to our doom. The right paraphrase of (39) requires the modal to be in the subjunctive:

(42) I know where we *could* go (if we weren't so exhausted). The problem is we'll never make it across the chasm.

4 Explaining the Observations

I say that know how involves knowledge of an answer to a question involving ability; but, as with infinitival questions generally, that question can be

understood indicatively or subjunctively. I'll first lay out the details of this view and then show how it predicts the data from §1.

4.1 The Account of Know How

I assume, as intellectualists typically do, that knowing how is knowing the answer to a how-infinitival question.

In general, the semantic value of a question is taken to be the set of propositions that answer it.²⁴ And when we attribute knowledge of questions, we simply attribute knowledge of an answer to the question.²⁵ A standard way to capture this, following Karttunen (1977), is to give “knows” two meanings. One is the standard propositional meaning. The other is a question meaning, which I mark with a *q*-subscript. You know_{*q*} *Q* just in case you know a proposition that answers *Q*.²⁶

Infinitival questions, as we already saw, are thought to contain a silent modal. The majority of linguists also posit in infinitival questions a special silent pronoun called *PRO*.²⁷ So the actual structure of (25) is something like:

(43) John knows who *PRO* CAN to call.

PRO tends to corefer with the subject of the knowledge claim; so *PRO* here would refer to John.

I say that the silent modal in know how ascriptions is an *ability* modal. That means the structure of a know how claim is as follows:

(44) S knows_{*q*} how *PRO* CAN *A*

And, given the standard assumptions above, a structure like this is true

²⁴For concreteness, I here assume the Karttunen (1977) view of answers. But the view of Hamblin (1973) and Groenendijk and Stokhof (1984) would serve my purposes just as well.

²⁵There are some controversies over the quantifier here which I set aside.

²⁶This ambiguity is not strictly essential as Groenendijk and Stokhof (1984) and Ciardelli et al. (2018) show. I choose ambiguity to minimise formalism.

²⁷See Landau (2013) for a near overwhelming battery of arguments.

just in case for some B , S knows that S can A by B -ing.²⁸ More officially, we have the following truth-conditions:

Know How.

$\llbracket S \text{ knows}_q \text{ how } PRO \text{ CAN}_f A \rrbracket^{c,w} = 1$ iff in w there's some B such that S knows $S \text{ CAN}_{f_c} A$ by B -ing

Given my arguments in §3, there will be two readings of know how ascriptions, corresponding to the two possible modal bases. When the modal base is indicative, we get an indicative know how claim of the form:

$S \text{ knows}_q \text{ how } PRO \text{ CAN}_{f_i} A$

This kind of claim is true just in case S knows how they can ϕ , *given the actual facts about the case*. When the modal base is subjunctive, we get a subjunctive know how claim:

$S \text{ knows}_q \text{ how } PRO \text{ CAN}_{f_s} A$

²⁸As a reviewer notes, one might worry that this account will struggle with know how of basic actions: to know how to lift my arm I must know of some A that I am able to lift my arm by doing A . But, one might think, this is impossible if lifting my arm is basic: surely when A is basic there can never be any B such that I am able to do A by doing B .

I think the right thing to say here is that, if A is basic, then you are not able to do it by doing anything *else*; but you may be able to do A just by doing A itself. One might recoil at the idea that one might be able to do A by doing A . I am happy to grant that there may be related notions in action theory which do not work like this. But our question here is natural language ascriptions of the form " S is able to do A by B -ing". While it is certainly odd to say, I think there is evidence that it can be true that one is able to do A by doing A . For if it were not, then we would expect the following to be trivially true.

- (i) Alice can't hit the dartboard by hitting the dartboard.

But far from sounding true, this sounds like a contradiction to me and others. So I prefer to think it can be true that one is able to do A by doing A ; there is just good pragmatic reason not to say so.

Notice this does not necessarily trivialise ability. While I don't have the space to defend this at length, I am inclined to think sentences of the form " S is able to do A by doing B " *assert* that if S does B , S will do A ; and they *presuppose* that one is able to do B . (I think this is derivable from the conditional analyses of ability in Mandelkern et al. (2016) and Boylan (forthcoming).) Thus, " S is able to do A by doing A " is not trivial because it presupposes one can do A in the first place.

A subjunctive know how claim is true just in case S knows how they can ϕ , given only the facts held fixed *subjunctively*.

4.2 Back to *Two Readings and Indeterminacy*

Both my data points simply fall out of this account.

The basic explanation of *Two Readings* is simple: indicative know how entails ability; subjunctive does not. Let's return to the *The Injured Pianist*, where there are true and false readings of the claim:

- (1) Rachmaninov knows how to play his Third Piano Concerto.

My theory assigns two possible structures to this claim, depending on whether the modal base is indicative or subjunctive:

- (45) Rachmaninov knows how $PRO\ CAN_{f_{c,i}}$ play his Third Piano Concerto.
(46) Rachmaninov knows how $PRO\ CAN_{f_{c,s}}$ play his Third Piano Concerto.

The former is false and the latter true, I claim, because only the former entails an ability ascription.

Let's start with (45). On my semantics, this is true just in case the following holds:

- (47) For some A : Rachmaninov knows that he $CAN_{f_{c,i}}$ play his Third Piano Concerto by A -ing.

But knowledge is factive; and $CAN_{f_{c,i}}$ is simply what ordinary ability ascriptions express: after all, those are ability ascriptions in the indicative mood. So (47) entails:

- (48) For some A : Rachmaninov is able to play his Third Piano Concerto by A -ing.

And this claim is false: Rachmaninov can't play the concerto at all.

Now take the subjunctive reading of (46):

- (46) Rachmaninov knows how he $CAN_{f,c,s}$ play his Third Piano Concerto.

This entails a subjunctive ability claim:

- (49) For some A Rachmaninov $CAN_{f,c,s}$ play his Third Piano Concerto by doing A .

But this does not entail an ordinary, indicative ability ascription; the subjunctive holds fewer facts fixed. What's more, it's plausible that Rachmaninov has the subjunctive ability to play the concerto by playing it in just the way he used to. The subjunctive reading does not hold fixed all the actual facts about one's physical constitution and so Rachmaninov's injury is no barrier to (46) being true. I contend it is true, though it entails nothing about Rachmaninov's indicative abilities.

Indeterminacy is explained because both indicative and subjunctive ability can be indeterminate; and this indeterminacy projects into knowledge claims. Recall:

Unreliable Dartboard. Carol is at an early stage in learning to play darts. Half of the time she hits the dartboard when she tries; half the time she misses it completely.

We said that it is indeterminate whether Carol is able to hit the dartboard: it neither seems right to say she can, nor that she can't.

This indeterminacy projects into knowledge of certain questions. Consider:

- (50) Carol knows how she is able to hit the board.

No action available to Carol settles that she hits the dartboard; so unsurprisingly (50) is not true. But again, neither is its negation:

- (51) Carol doesn't know how she is able to hit the board.

(51) does not sound true because, like (50), it presupposes something that is not true: both presuppose that there is indeed some way that Alice can hit the dartboard, that there is some true answer to the question. This not being true, *both* fail to be true and so are indeterminate.

Given this presupposition, my theory explains why it is indeterminate whether Carol indicatively knows how to hit the dartboard. Just like (51), this presupposes there is some way that Carol is indicatively able to hit the dartboard. But there is not.

This explanation carries over to the subjunctive reading also. We said that, when Carol is injured, it is still indeterminate whether she knows how to hit the dartboard. Here it is also indeterminate whether she has the subjunctive ability to hit the dartboard. The subjunctive reading of the modal here will not hold fixed Carol's actual injury. And, as we said before, if she were uninjured, it would be indeterminate whether she was able; thus the subjunctive reading is indeterminate. From here, the explanation is the same as for the indicative: the know how claim is indeterminate because all of the possible answers to the question are too.

5 Intellectualism or Just Propositionalism?

It is now time to reconsider the question of propositionalism vs. intellectualism. For, as a reviewer notes, one may protest that thus far I have only given an argument for propositionalism. I have argued that know how attributions contain infinitival questions. But doesn't this tell us merely that the *relatum* know how attributions is propositional? And if so, how could intellectualism be established?

I agree that there is no entailment, but nonetheless I say that we have an argument for intellectualism: anti-intellectualism sits very badly with the claim that know how attributes involve relations to questions. The basic issue is this. Suppose the anti-intellectualist concedes that know how attributions contain infinitival questions. They then design a meaning for "knows" that, given a how-infinitival question, can derive anti-intellectualist truth conditions for know how ascriptions. What happens when we give

other questions to that meaning of "knows"? More or less inevitably, we end up generating absurd non-existent readings of other attributions of knowledge of questions.

To warm up, consider a kind of anti-intellectualist view which takes there to be a meaning of "knows" where it simply means ability.²⁹ As mentioned in §2, there are plenty of views of ability where ability is a relationship between a person and a proposition: a person bears that relation to a proposition p just in case they are able to bring it about that p is true. Now a question is a set of propositions, but this view is easily extendable to such sets: we could say that a person bears an ability relation to a set of propositions just in case they are able to bring it about that *some* of the propositions are true; or we could say it requires the ability to make *all* the propositions true. Thus we are positing a meaning that says something like this: "S knows Q ?" is true iff S is able to bring about one of the propositions in Q ?

There is no reason that this meaning of "knows" should only be able to combine with how-infinitivals. If this meaning of "knows" combines with questions, it should be able to combine with questions other than how-infinitivals. But then we get absurd results. Consider the sentences:

(52) John knows how Susie beat Kasparov.

(53) John knows what to do.

Our anti-intellectualist meaning of "knows" predicts that (52) can be used to say that John is able to bring it about that Susie beat Kasparov in some way. It plainly does not have such a meaning. (53) shows that, even if we restrict this meaning to infinitivals somehow, we still get bad results. The infinitival question in (53) seems to roughly mean the same thing as *what should John do?*, a question which has as answers things of the form *John should stick up for his friends* and *John should not invite people at dinner parties*.

²⁹Granted, typically anti-intellectualists take "knows how", rather than just "knows", to be something like an idiom. But this is already ruled out by taking know how to be a relation to an infinitival question.

But (53) cannot be used to say that *John is able to bring it about* that he should do such things.³⁰

The anti-intellectualist would thus have to cook up a very complicated meaning for "knows", one that can output radically different propositions, depending on the kind of question supplied. The best I can offer them is something like this: when *Q* is of the form *how does S do A?*, "S knows *Q*?" simply denotes an answer to *Q*?; otherwise, it denotes the proposition that *S* knows an answer to *Q*?:

Despite being heavily disjunctive, this still makes bad predictions. For consider the sentence below:

(54) John knows how he himself is able to play the piano.

If I am right, on the indicative reading of how-infinitives, the how-infinitival means the same thing as the question embedded under "knows" above. Thus this sentence is predicted to have a meaning where it simply says that John is able to play the piano in some way or other, where it says nothing at all about his knowledge and indeed is consistent with him having none.³¹

Notice that the intellectualist has no such problems: since they say it is, more or less, the normal meaning of "knows" throughout, none of these absurd readings are predicted. The lesson I think is this. Anti-intellectualism is not inconsistent with propositionalism. But it *is* in tension with the claim that know how is a relation to a question. The anti-intellectualist should instead find some way to reject the argument that know how involves infinitival questions; after all, most formulations of anti-intellectualism typically don't have these problems *precisely because* they deny this.

Intellectualists still of course have various debts to pay: they must ex-

³⁰This strategy may not even get the right results for know how ascriptions themselves: "S knows how to A" would say that S is able to bring it about some proposition(s) about S being able to do A in a certain way.

³¹This is also a problem for a weak intellectualism which denies that "knows" here denotes a relation that involves belief or justification. (54) is particularly difficult here. The weak intellectualist might be tempted to say that that certain propositions can only be known theoretically: if you know them at all, you must have theoretical knowledge of them. But that move is not possible for (54), on pain of collapsing their view back into strong intellectualism.

plain the appearance of know how without belief;³² and they must account for apparently special epistemic properties of know how.³³ Nonetheless, I contend, we have a powerful new argument for the view. Knowledge of infinitival questions gives rise to a distinctive context-sensitivity. In particular their subjunctive reading is *not* an instance of more general kinds of context-sensitivity; the subjunctive holds fixed quite different things from the ordinary context-sensitivity available to ability modals. If know how is knowledge of an infinitival question about ability, we resolve the puzzle we started with: we account for the apparent heterogeneity of know how without completely losing a connection between know how and ability.

6 No Practical Modes of Presentation

Before concluding, let me advertise one last virtue of my account. Many intellectualists at some point appeal to *practical modes of presentation*. I claim they are not in fact necessary for my account.

The problem motivating practical modes of presentation is simple. There are trivial ways for you to know that something is a way for you to do *A*: if I see someone very like me cycling a bike then I know that whatever they are doing is a way to cycle a bike; but clearly this does not suffice for me to know how to cycle. Stanley and Williamson's diagnosis is that this proposition is not known under the practical guise necessary for know how. There have been serious attempts to spell out what these guises amount to, in particular by Pavese (2015, 2017, 2019). But many are convinced that this is a major weak spot for intellectualism.³⁴

There is no problem of easy know how for indicative know how. As Brogaard (2011) observes, if know how entails ability, then there is a simple reason why easy know how is not possible: the agents lack the relevant abilities. Just seeing someone cycle does not give me the ability to cycle.

³²See Wallis (2008), Cath (2011) and Brownstein and Michaelson (2016).

³³See Cath (2011, 2015). But also see Marley-Payne (2016) for what is to my mind a compelling reply.

³⁴See in particular Koethe (2002), Schiffer (2002) and Glick (2015).

There is also no problem of easy know how for subjunctive know how. To figure out what your abilities are, your physique and environment alone do not suffice; what you *know* matters too. Consider a simple version of *The Hike*, where we are in peak physical conditional but I have forgotten the way back. The following is false:

(55) I am able to lead us back to camp.

But not for lack of *physical* abilities: I am perfectly able to go through the sequence of motions that would lead us back to camp. It is because I do not *know* where the chasm is that I am not able to get us back. Ability has an epistemic, as well as a physical, component.

I argued in §3 that the subjunctive readings hold fixed our actual knowledge. Thus, subjunctive know how requires that you *actually* have the requisite propositional knowledge for subjunctive ability. But this knowledge is lacking in the cases of easy know how. Start by imagining I have an identical twin, who has just learned to cycle. What is the difference between us? We have the same physical abilities; and yet only one of us can cycle. I think the difference lies in what we *know* about cycling. I know very little, just that some demonstratively identified way is a way to cycle. My twin knows a lot more: that through practice, they know they have to push off at a certain speed to stay balanced, that they must exert a certain force on the pedals to achieve this speed, and so on. Not having any of this knowledge, I do not have the subjunctive ability to cycle.

The epistemic component of ability allows me to deflect a *positive* argument for practical modes of presentation. Pavese (forthcoming) claims practical modes of presentation are still required, even if know how entails ability. She gives the following case:

Mary is a skilled swimmer who is one day affected by memory loss and so forgets how she is able to swim... Nothing has changed in Mary's physical state: she is still able to swim but she just has forgotten how she is able to swim. Suppose she is told, by looking at a recording of her swimming the day before,

that that is how she can in fact swim given her current physical state. She might come to know how she is in fact able to swim (just like that!). Yet, she still fails to know how to swim in the relevant sense and would still drown if thrown into the pool. (Pavese (forthcoming))

Pavese claims we cannot explain Mary's lack of know how by appeal to ability: it is supposed to be *true* that she is able to swim.

I do not share this judgement about Mary. As Pavese notes, she would drown if thrown into the pool: this is hardly the mark of those able to swim. I agree it is *physically possible* for her to swim, but this is not the same thing. Ability, as I just noted above, places epistemic requirements on subjects, as well as physical ones. This is exactly what Mary loses in this case; and so she loses the ability to swim.

Ultimately I think practical modes of presentation are not required because, in a sense, know how always entails ability, be it either indicative or subjunctive. Know how is never easy because ability is never easy.

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