Knowing (How)

Jason Stanley

Forthcoming in *Nous*

Propositional knowledge is the knowledge attributed by sentences of the form 'x knows that p'. Knowing where to F, knowing why to F, and knowing when to F are all definable in terms of propositional knowledge. For example, one knows where to find an Italian newspaper in New York just in case, for some place p, one knows that p is a place to find an Italian newspaper in New York. Similarly, one knows why to find an Italian newspaper in New York just in case, for some reason r, one knows that r is a reason to find an Italian newspaper in New York. According to Gilbert Ryle, however, knowing how to F is not propositional knowledge. Instead, knowing how is a distinctive kind of non-propositional mental state. On this view, *knowing how to find coffee in New York City* is a fundamentally different kind of cognitive state from *knowing where to find coffee in New York City*, *knowing why to find coffee in New York City*, or even *knowing how Bill finds coffee in New York City*. The latter are propositional knowledge states, whereas the former is not; the fact that it is expressed with the same word is an accident of the English language.

Ryle's claim has been assimilated into the canon of accepted doctrine in philosophy and psychology, and much work has been predicated upon Ryle's distinction. However, Ryle's claim has recently come under renewed scrutiny. Stanley and Williamson (2001) argue that Ryle's arguments for a dichotomy between knowing-how and knowing-that are thoroughly incorrect, and conclude that knowing how to F, like knowing where to F and knowing why to F, can be defined in terms of propositional knowledge.

Let us say that *Intellectualism about knowing how* is the thesis that knowing how can be defined in terms of knowing that.[1] Stanley and Williamson treat a number of Ryle's objections to Intellectualism in detail. But the ensuing years have demonstrated continued reluctance to abandon Ryle's position. It is clear that certain pressures on Intellectualism have yet to be alleviated. In this paper, I consider three of the most pressing issues in the debate, and show that their resolution weighs in on the side of the Intellectualist. The first is that Intellectualism seems to have the consequence that

knowing how to do something requires implausible verbal intellectual competence. This objection arises naturally from the thought that propositional knowledge is knowledge that can be verbally articulated. The second is that knowing how lacks certain distinctive features of propositional knowledge. In particular, knowing how is not susceptible to the famous Gettier counterexamples to the analysis of knowledge in terms of justified true belief. Though these objections were addressed in Stanley and Williamson (2001), they still haunt the literature today.

The third issue involves the everyday, or "folk" notion, of knowing how, the one that plays a role in ordinary folk psychological explanations of action. This is the notion expressed by ordinary ascriptions of knowing how, such as "John knows how to ride a bicycle", or "Hannah knows how to swim." The Rylean position gains part of its initial plausibility from its apparent faithfulness to the ordinary folk notion, and indeed, Ryle in part relied on linguistic arguments about ascriptions of knowing how to support his position. But closer investigation of the ordinary ways in which we express knowing-how suggests that our ordinary notion of is not Rylean in character. For example, in English, we say that people know how to do things via the construction "knows how + infinitive". The fact that we speak of knowing how in this way in English raises a problem for the Rylean that has long been exploited by Intellectualists about knowing how (Brown, 1970, Stanley and Williamson, 2001). It is a common assumption between the Rylean and the Intellectualist that sentences involving constructions like "know where + infinitive", "know when + infinitive", "know why + infinitive", etc. all can be defined in terms of propositional knowledge. But given that ascriptions of knowing-how in English look so similar to such ascriptions, it is hard to see how they could ascribe a different kind of mental state. This provides a powerful argument in favor of the conclusion that our ordinary folk notion of knowing-how can be defined in terms of propositional knowledge. Insofar as the Rylean position gains plausibility by reflecting the notion of knowing-how that plays a central role in folk psychological explanation, this is a serious problem for it.

However, as Ian Rumfitt (2003) has argued, this kind of argument in favor of the thesis that our everyday notion of knowing how can be defined in terms of propositional knowledge may depend upon superficial features of the English language, features that

are absent from ascriptions of knowing-how in other languages. One might think that once we take a serious cross-linguistic look at ordinary ways of ascribing knowledge-how, we will discover that they are not very similar to sentences that ascribe propositional knowledge. If so, then an important argument in favor of Intellectualism about knowing how will have been undermined.

1. The Theory in Stanley and Williamson (2001)

According to Intellectualism about knowing how, knowing how to do something is equivalent to knowing in what way one could do it. So, for example, you know how to ride a bicycle if and only if you know in what way you could ride a bicycle. But you know in what way you could ride a bicycle if and only if you possess some propositional knowledge, viz. knowing, of a certain way w which is a way in which you could ride a bicycle, that w is a way in which you could ride a bicycle. This is essentially the view of knowing how advocated in Stanley and Williamson (2001).

Stanley and Williamson begin by emphasizing the similarity between sentences of the form in (1):

(1) a. John knows where to find coffee in New York City.
b. John knows why to find coffee in New York City.
c. John knows when to find coffee in New York City.
d. John knows how to find coffee in New York City.

Such sentences involve the verb "know", a question word ("where", "why", "when", and "how", respectively), and an infinitive, "to find coffee in New York City". Intuitively, the question word "where" quantifies over *places*, "why" quantifies over *reasons*, "when" quantifies over *times*, and "how" quantifies over *ways*.

The sentence (1a) has a natural reading according to which it is true if and only if there is a place p that is a place where John can find coffee in New York City, and John knows that p is a place at which he can find coffee in New York City. In short, (1a) can naturally mean that somewhere is such that John knows that it's a place at which he can

find coffee. More generally, each of the sentences in (1) has a reading synonymous with the corresponding sentence in (2):

(2) a. For some place p, John knows that he can find coffee in New York City at place p.
b. For some reason r, John knows that he can find coffee in New York City for reason r.
c. For some time t, John knows that he can find coffee in New York City at time t.
d. For some way w, John knows that he can find coffee in New York City in way w.

It is fairly uncontroversial, and indeed intuitively obvious, that (1a-c) have the readings given in (2a-c). But then it seems hard to deny that (1d) is naturally read as expressing the proposition in (2d), and indeed this is the basic analysis that Stanley and Williamson suggest for a sentence such as (1d). As we shall see, this is also the analysis that most linguistic theories of "embedded question" constructions entail for sentences such as the ones in (1).

Stanley and Williamson's analysis involves one more layer of complexity. Consider the analysis (2a) of (1a). According to this analysis, John knows where to find coffee in New York City if and only if there is a place p where he could be coffee in New York City, and he knows that p is a place at which he could buy coffee in New York City. But intuitively at least, (2a) could be true while (1a) is false. Suppose that John has never been in New York City, and could not find his way around the city. But Bill, whom John trusts very much, shows John a picture of a building in New York City, and tells him that it is a place at which John could purchase coffee. Then (2a) is intuitively true, but (1a) is intuitively false. More is required for the intuitive truth of (1a) than simply the truth of (2a). It must not only be that there is a place p of which John knows that he can buy coffee there. John must also think of that place *in the right way*. Intuitively, in order for (1a) to be true, John needs to know of a particular place that he can buy coffee there, and also think of that place in a way that enables him to locate it in objective space. Intuitively, knowing where to find coffee therefore does not just involve knowing of a place that it is a place where one can buy coffee. One must also think of the place under the right "mode of presentation", as the Fregean would say.[2]

As for knowing-where, so for knowing-how. In the very same way in which the truth of (2a) is not sufficient for the intuitive truth of (1a), (2d) is not sufficient for the intuitive truth of (1d). It is not enough that there is a way w that is a way in which John could find coffee in New York City, and John knows that w is a way in which he could find coffee in New York City. After all, someone John trusts may just have indicated such a way, and told John that it is a way he could find coffee in New York City. Intuitively, for John to know how to find coffee in New York City, he must think of the way of finding coffee in New York City *in the right way*, that is, *under the right mode of presentation*. Stanley and Williamson call the mode of presentation of a way of doing something that is intuitively required for knowing-how, *a practical mode of presentation*. This is the additional layer of complexity Stanley and Williamson's analysis adds to the analysis of the sentences in (1) in terms of the sentences in (2). It is same kind of additional complexity needed in the analysis of the intuitive truth-conditions of all the sentences in (1), and indeed, as they emphasize, in the analysis of *all* expressions that create intensional contexts, such as "knows".

What is it to entertain a way under a practical mode of presentation? As Stanley and Williamson emphasize, this question is no easier than the question of what it is to entertain a person under the "I" mode of presentation, or a place under the "here" mode of presentation. But as in these other cases, to entertain something under a practical mode of presentation is to have a certain complex of dispositions towards that thing. Compare, for example, the case of "here":

(3) I know that it's cold here.
(4) I know that it's cold in Kingston, Ontario.

Even when both (3) and (4) are uttered in Kingston, Ontario at the same time, they express intuitively different truth-conditions. I might, for example, not know that Kingston, Ontario is *here*. So the intuitive truth-conditions of utterances of (3) are sensitive to the way in which the speaker thinks of the place she is now located; in short, they are sensitive to whether she thinks of that place under a "here" mode of presentation. According to one prominent account of the "here" mode of presentation (Evans, 1980, p. 168):

> A thought about a position in egocentric space (including the utterly non-specific *here*) concerns a point or region of *public* space in virtue of the existence of certain indissolubly connected dispositions, on the part of the subject, to direct his action to that place, and to treat perceptions of that place as germane to the evaluation and appreciation of the consequences of the thought.

On Evans's view, one thinks of a place under a "here" mode of presentation only if one is disposed to take information for that place as relevant for one's actions in a particular way. If it is, for example, raining at that place, then one should be disposed to seek an umbrella. That is, thinking of a place under the "here" mode of presentation involves possession of a complex set of dispositions towards a place.

Similarly, thinking of a person under the "I" mode of presentation involves possession of a particular set of dispositions towards that person. To take a well-known example, staring into a mirror that I believe to be a window, I come to believe that that man's pants are on fire. Though I have a belief about someone who is in fact myself, I am thinking of myself under a *demonstrative* mode of presentation, rather than a *first-personal* one. In the envisaged case, I do not think of myself under a first-personal mode of presentation, because I am not disposed to take information about the man I see as relevant to my actions. If I did think of that man under a first-personal mode of presentation, I would start beating my pants with my hands, rather than laughing.

In a precisely similar sense, thinking of a way under a practical mode of presentation involves possession of a complex set of dispositions towards a way of doing something. Just as with the shop-worn example just discussed, I can think of a way under a demonstrative mode of presentation, and fail to think of it under a practical mode of presentation. I only think of a way of doing something under a practical mode of presentation if I am disposed to employ it under various counterfactual circumstances. I may think of the very same way under a demonstrative mode of presentation, without having any such dispositions. Of course, it is no easier to say what these dispositions are in the case of practical modes of presentation than in the case of 'here' thoughts or 'I' thoughts. But it is also no harder.

In short, if modes of presentation are part of the semantics (rather than just part of the pragmatics), X knows how to F if and only if for some way w, X knows that X can F

in way w, and X entertains w under a practical mode of presentation. If modes of presentation are just part of the pragmatics, then our *intuitions* about the truth and falsity of ascriptions of knowing-how are sensitive to practical modes of presentation, but the actual truth and falsity of the propositions expressed by such ascriptions is not. Stanley and Williamson show that modes of presentation are relevant to the intuitive truth and falsity of ascriptions of knowing-how, but remain neutral on thorny issue of whether modes of presentation should be part of the semantic analysis of propositional attitude constructions generally. I shall maintain the same neutrality on this issue below.

The analysis is thoroughly intellectualist; knowing how to F is a matter of having propositional knowledge. Like *all* knowledge attributions, intuitive judgments about the truth or falsity of such judgments are sensitive not just to the components of the proposition putatively known, but also to the way in which the subject thinks of them. It would be odd to maintain that ascriptions (such as (3)) of knowledge of propositions about the place one is at are less than fully propositional, on the basis of the fact that it is not easy to define a *here* mode of presentation. For the same reason, it would be odd to maintain that ascriptions of knowledge-how are less than fully propositional, on the basis of the fact that it is hard to define a *practical* mode of presentation. As Stanley and Williamson (2001, 428-30) show, there is just as much evidence, and of the exact same kind, for a practical mode of presentation as there is for a first-person mode of presentation associated with the pronoun 'I', a special mode of presentation associated with 'here', or a special mode of presentation associated with 'now'. In fact, as we have just seen, ascriptions of knowledge-where also seem conventionally associated with their own modes of presentation. But this gives us no reason to think that they are less than fully propositional.

2. Knowing how to F and knowing how to explain how to F

The most common reason one encounters for rejecting the view that knowing how can be defined in terms of knowing that is that it is clear that someone can know how to do something, without being able to *explain* how to do it. So, for example, someone can know how to ride a bicycle without being able to *explain* how to ride a bicycle, and at the

age of 8 Mozart knew how to write a symphony without being able to *explain* how to write a symphony. If it is a consequence of the Intellectualist view of knowing how that knowing how to do something entails being able to explain to do that activity, then knowing how to do something is not propositional knowledge.

For example, Stephen Schiffer (2002, p. 201) argues that since Mozert knew how to write a symphony at the age of 8, but could not explain how he wrote it, knowing how is not definable in terms of knowing that. Similarly, Charles Wallis (2008, p. 130) writes:

> …experts are certainly candidates for ascriptions of knowledge-how with regard to their field of expertise. Physicists know how to solve physics problems. Grand masters know how to play chess. If know-how consists in conscious or consciously accessible beliefs, and the exercise of know-how consists of conscious, general reasoning about practical matters, then one would expect these experts to be able to easily articulate the practical directives guiding their actions (know-how). However, it is well-known in psychology and artificial intelligence that experts often have great difficulty in consciously accessing and in expressing their knowledge…

The premise behind these arguments against the Intellectualist position is that if knowing how to do something is propositional knowledge, then knowing how to do something entails being able to explain how to do it. But it is hard to see what justifies this premise. Even if knowing how to ride a bicycle is a certain kind of propositional knowledge, it is completely unclear why possession of this knowledge requires any special linguistic abilities. As Jerry Fodor (1968, p. 634) writes:

> There is a real and important distinction between knowing how to do a thing and knowing how to explain to do that thing. But *that* distinction is one that the intellectualist is perfectly able to honor…the ability to give explanations is itself a skill – a special kind of knowing how which presupposes general verbal facility at the very least. But what has this to do with the relation between knowing how and knowing *that*? And what is there here to distress an intellectualist?[3]

Being able to do something and knowing how to do it are certainly not the same. But in most if not all cases, if one is able to explain how to do something, one knows how to explain how to do that activity. So, if knowing how to do something entails being able to explain how to do it, then in most if not all cases, knowing how to do something

should be linked to knowing how to explain how to do that activity. But the theory in Stanley and Williamson clearly invalidates the inference from 'X knows how to F' to 'X knows how to explain how to F'. According to it, an instance of 'X knows how to ride a bicycle' is true if and only if, for some way w which is a way in which x could ride a bicycle, x knows that w is a way in which x could ride a bicycle. But instances of 'X knows how to *explain* how to ride a bicycle' have quite different truth-conditions. On Stanley and Williamson's theory, x knows how to *explain* how to ride a bicycle if and only if for some way w, which is a way in which x could explain how to ride a bicycle, x knows that w is a way in which x could explain how to ride a bicycle. So knowing how to ride a bicycle involves knowledge of a distinct proposition than does knowing how to explain how to ride a bicycle. Knowing how to explain how to ride a bicycle, as Fodor points out, at least involves being acquainted with some way of *explaining* how to ride a bicycle. But grasp of a way of explaining how to do something is not required for knowing how to ride a bicycle. On Stanley and Williamson's theory, only grasping a way of riding a bicycle is required to know how to ride a bicycle. There is no reason to think that knowing that w is a way in which one could ride a bicycle requires knowing, of some way w' that is a way of *explaining* how to ride a bicycle, that w' is a way of explaining how to ride a bicycle. So, if we in fact look at the details of an intellectualist theory, we see that there is little direct connection drawn in such theories between knowing how to do something, and knowing how to explain how to do it (and presumably, then, little direct connection to being able to explain how to do it).

However, perhaps the very fact the Intellectualist defines knowing how in terms of propositional knowledge suggests that someone who knows how to do something must be able at least to express her propositional knowledge. As Schiffer (2002, p. 200) writes:

> Typically, if a person knows p- and thus knows it under some mode of presentation or other- she is also able to assert p, where this entails the ability assertively to utter a sentence that, in the context of utterance, expresses p.

If that were true about propositional knowledge, then the view that knowing how is definable in terms of propositional knowledge would suggest that typically someone who

knew how to F could express their knowledge linguistically, even if she could not explain it. And, even with the "typically" hedge, that may seem problematic.

The premise of this argument against the Intellectualist Legend is that typically, if someone knows that p, then they have the ability to express that proposition in words; that propositional knowledge is knowledge that can be easily articulated. Whether this premise is true or false depends upon which words count. If all words count, including demonstrative expressions such as "this", then the premise may be true, but raises no problem for the Intellectualist. The 8 year old Mozart can assert the proposition that constitutes his knowledge how to compose a symphony; he can just say say, while composing it, the German translation of "this is how I can do it".

On the other hand, if knowing that p requires one having some way of expressing p in terms that do not contain demonstrative or indexical expressions, or names invented for the occasion, the premise is false, or at least a bold and controversial claim that requires elaborate defense. As I cast my eye about my living room, I see many shades for which I lack a non-demonstrative involving description. I know that the table I write on is this shade of brown, and the cupboards are that (different) shade of brown. But the only way I have of *expressing* my propositional knowledge about the shades of brown is in demonstrative involving terms.

Reflection on cases reveals no asymmetry of the sort Schiffer wishes to draw between uncontroversial examples of propositional knowledge and knowledge how. Consider a boxing match between a southpaw and an expert boxer. The southpaw is winning on points. But then the expert boxer adjusts and starts boxing in a particular way that is the best way to fight against a southpaw. The announcer, pointing at the way in which the expert boxer is fighting, utters "He knows that that's the best way to beat a southpaw". The announcer's knowledge-ascription is quite explicitly a true ascription of knowledge-that. Furthermore, it is true *whether or not* the boxer is able to verbalize his knowledge of the way in question of boxing against a southpaw in non-demonstrative, non-indexical terms (we may suppose, for argument's sake, that he also lacks a name for the way of boxing he is employing). This is a straightforward case of propositional knowledge in which an expert has some knowledge that he cannot verbalize in non-indexical, non-demonstrative terms. So it isn't in fact true of straightforward

propositional knowledge attributions that they require the subject of the ascription to be able to express the proposition known in non-indexical, non-demonstrative terms. Therefore, it can hardly be a condition on an Intellectualist Account of knowing how that it ascribes to agents skills absent in many uncontroversial cases of propositional knowledge.

What accounts for the intuitive appeal behind the above objections to the Intellectualist position is something like the following thought: If knowing how can be defined in terms of propositional knowledge, then knowing how to F requires knowing a proposition. But knowing a proposition requires being able to explain to others all the features of the proposition grasped. Even more minimally, knowing a proposition involves grasping that proposition. But grasping a proposition typically requires having some verbal ability to describe the constituents of the proposition grasped. As we have seen, none of the premises in such arguments survive close inspection.

3. Gettier Problems

If knowing-how is a species of knowing-that, then properties of knowing-that should be properties of knowing-how. One property of propositional knowledge is that it is stronger even than justified true belief, as the infamous 'Gettier cases' show. Here is a classic example of a Gettier case. Suppose that Bill sees his colleague Fred driving in a Porsche. Believing on this basis that Fred owns a Porsche, Bill then infers that a colleague of his owns a Porsche. Unbeknownst to Bill, his other colleague Hannah owns a Porsche, which she had lent to Fred for the day. So Bill has a justified true belief that a colleague of his owns a Porsche. But intuitively, Bill's belief that a colleague of his owns a Porsche is not a case of knowledge.

If knowing-how is a species of knowing-that, then one would also expect there to be Gettier cases for knowing-how.[4] But one might worry that, in the case of the putative propositional knowledge that intellectualists identify with knowing how, there are no such gaps. If so, the knowing how is not a species of knowing that. As Stanley and Williamson put the worry:

> According to our proposal, knowledge-how is a species of knowledge-that. But we can imagine cases of justified true belief that fail to be knowledge-that, because they fail to satisfy some extra condition. However, it is difficult to imagine examples that fall short of being knowledge-how for a similar reason. That is, one might think it is difficult to conceive of Gettier-cases for knowledge-how. But if knowledge-how is a species of knowledge-that, there should be such cases.

Stanley and Williamson not only frame the concern for their own intellectualist proposal, they also provide a response:

> Bob wants to learn how to fly in a flight simulator. He is instructed by Henry. Unknown to Bob, Henry is a malicious imposter who has inserted a randomizing device in the simulator's controls and intends to give all kinds of incorrect advice. Fortunately, by sheer chance the randomizing device causes exactly the same results in the simulator as would have occurred without it, and by incompetence Henry gives exactly the same advice as a proper instructor would have done. Bob passes the course with flying colors. He has still not flown a real plane. Bob has a justified true belief about how to fly. But there is a good sense in which he does not know how to fly. (op. cit., p. 435)

However, one might have a concern about Stanley and Williamson's appeal to intuition here. Perhaps it is simply not "intuitively true" that I don't know how to fly in such a situation. Perhaps, intuitively, simply being in possession of a way of flying is enough to know how to fly. If so, then knowing-how is not subject to Gettier cases, and so lacks distinctive features of propositional knowledge. The worry about Stanley and Williamson's defense of the Intellectualist Legend is therefore that their appeal to intuition is spurious.[5]

Ted Poston (forthcoming) provides a general argument that there are no Gettier cases for knowledge-how. His argument involves two premises:

> (P1) Gettier cases for know-how, if they exist, require that the subject intelligently and successfully F, where F ranges over actions.
> (P2) If one can intelligently and successfully F, then one knows how to F.

Poston's argument entails that there can be no Gettier cases for knowing-how. I do not wish to dispute Poston's (P1). The problems are rather with (P2). First, exploiting (P2) as

a premise seems rather unfair in an argument against the view that there are Gettier cases for knowing-how. As Poston himself recognizes, the intelligence condition and the success condition "are analogous to the justified belief condition and the truth condition in Gettier cases of knowledge that". So appealing to (P2) is a blatant example of the fallacy of begging the question. Be that as it may, (P2) is false, as has been demonstrated in recent work by Bengson, Moffett, and Wright (forthcoming).

Bengson, Moffett, and Wright (forthcoming) present 138 subjects with the following case:

> 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.

The subjects "were asked both whether Irina knows how to do the Salchow and whether Irina is able to do the Salchow." It is clear from the description of the case that Irina can intelligently and successfully do the Salchow. That is, Irina can intend to do the Salchow, and perform it reliably and successfully on the basis of her intention to do so. But only 12 percent of the participants in the study reported that Irina knows how to do the Salchow. In contrast, 86 percent of the participants in the subject judged that Irina is able to do the Salchow, but does not know how to do the Salchow. Surely, the vast majority of participants were right about both cases.[6] Therefore, Poston's (P2) is false, and his argument that there are no Gettier cases for knowing how fails.[7]

Bengson, Moffett, and Wright in fact also take this result to be a problem for Stanley and Williamson. Their reason is that, in a discussion of responses to David

Lewis's knowledge argument, Stanley and Williamson endorse the following thesis about the connection between intentionally acting and knowing how:

(IAK) If x intentionally Fs, then x knows how to F.

Since Bengson, Moffett, and Wright take Irina to be intentionally performing the Salchow when she performs it, they conclude that Stanley and Williamson are committed to the false consequence that Irina knows how to perform the Salchow.

However, there is a distinction between *intelligently and successfully performing the Salchow*, and *doing the Salchow intentionally*. Irina intends to perform the Salchow, and does so successfully, as a result of her intention. But it does not follow that Irina intentionally performs the Salchow. If I falsely believe that all tickets in the lottery win, and buy a ticket intending to win, and do win, it does not follow that I intentionally won the lottery. Indeed, if I falsely believe that all tickets in the lottery win, and buy a ticket intending to win, and every time I buy a ticket, a magical benefactor assures that I win, it does not follow that I intentionally won the lottery. Similarly, Irina has a false belief about how to do the Salchow, and she is lucky enough that whenever she intends to do the Salchow, she succeeds. Though she intelligently and successfully performs the Salchow, she does not *intentionally do the Salchow* when she succeeds, anymore than it follows that I *intentionally win the lottery* when I win the lottery after buying a lottery ticket intending to win. Of course, when Irina performs the Salchow, she does it with the intention of performing the Salchow, and there is a causal connection between her intention to perform the Salchow and performing the Salchow. But as we have learned from Davidson, F-ing with the intention of F-ing does not entail intentionally F-ing, even when there is a causal connection between one's intention to F and one's F-ing. In order to intentionally F, there must be the *right kind* of causal relations between one's intention to F, and one's F-ing, and those are lacking in Irina's case.[8]

So, Poston's (P2) is false. Intelligently and successfully performing an action is not sufficient for knowing how to do that action. Poston's route towards the conclusion that there are no Gettier cases for knowing how is closed. This leaves us with the

objection that the sort of cases described by Stanley and Williamson are simply intuitively implausible. In all such cases, the subjects do have the requisite know how.

It would be good to have more data on folk intuitions about Gettier cases and knowing how. But from the armchair at least, it seems that many types of uncontroversial propositional knowledge ascriptions are not intuitively Gettier susceptible. Suppose Mary learns to play tennis from a generally reliable tennis coach. The coach teaches her what is in fact a way to ace her regular opponent, a way that involves twisting her body to the left. However, the coach did not in fact intend to teach her this – he meant to deceive her, but because of incompetence in fact taught her correctly. Suppose, watching Mary ace her opponent, I say "Mary knows why to twist her body to the left in hitting that shot". This ascription seems perfectly true, even though Mary only has a justified true belief, and lacks genuine knowledge. Similarly, it also seems true that Mary knows where to hit the ball to ace her opponent, despite the fact that she only has a justified true belief about where to hit the ball.[9]

What these examples reveal is that, in the case of knowledge-wh, Gettier intuitions are less robust than in the case of ascriptions of explicit knowledge-that, if present at all. As John Hawthorne writes (2000, p. 202):

> Suppose I ask in an ordinary setting whether someone knows whether Boston is the capital of Massachusetts. Suppose it turns out that he does truly believe this though the epistemic credentials of his path to that belief are decidedly shaky: Perhaps he got it from a book that misprinted most of the state capitals though not this one. Perhaps he got the information from someone that he had good reason to distrust (who happened to be sincere on this occasion or else who tried to lie and accidentally told the truth on this occasion). Would your acceptance of the statement "Boston is the capital of Massachusetts" fail to be knowledge in such cases? Not so, or not clearly so.

Hawthorne is undeniably correct that many Gettier cases involving know-whether *seem* like knowledge. Despite the fact that ascriptions of knowledge-where and knowledge-whether are propositional knowledge ascriptions *par excellence*, the Gettier intuition is often weak or non-existent. Since ascriptions of knowing-how are ascriptions of knowing-wh, we should therefore expect Gettier intuitions for such cases also often to be weak or non-existent. But this has nothing whatever to do with whether they are

propositional knowledge ascriptions. As Hawthorne emphasizes, ascriptions of knowing-whether often do not appear Gettier-susceptible, despite clearly being ascriptions of propositional knowledge.

Why is it that knowledge-wh ascriptions seem less Gettier-susceptible than cases like "John knows that someone in his office drives a Ford?" One explanation involves the pragmatics of situations in which we ascribe such knowledge. Typically, when we make ascriptions like "John knows where to find the nearest chips shop", we are only interested in the truth or falsity of John's belief about the location of the nearest chips shop. We want to know whether, were John to set off on a search for chips guided by his belief, he would successfully obtain chips. Similarly, when we ask whether John knows how to ride a bicycle, we are typically only interested in whether, were John to set off on a bicycle guided by his belief about how to ride a bicycle, he would successfully be able to achieve his goal (perhaps of getting us chips). The reason we do not hear many ascriptions of knowledge-wh as Gettier susceptible is not because they are non-propositional. Rather, it is because the pragmatics of situations in which we ascribe knowledge-wh often places the focus on true belief, rather than justification.

The phenomenon of situations that give rise to focus on true belief rather than knowledge is familiar from explicit ascriptions of the form "x knows that p" (as Hawthorne also emphasizes (Ibid., p. 203)). Consider ascriptions of knowing that to quiz show contestants who make correct lucky guesses. With no trouble at all, we find ourselves saying things like "He knew the answer", or "That contestant was the only one who knew that Moscow is the capital of Russia", even when we are fully aware that it was a lucky guess.

According to the Intellectualist, ascriptions of knowing-how are instances of ascriptions of knowing-wh, such as "knowing whether", "knowing where", etc. As we have seen in this section, one objection to the Intellectualist is that Gettier intuitions are weak for ascriptions of knowledge-how. However, as we have seen, Gettier intuitions are often weak for ascriptions of knowledge-wh. Given this fact about ascriptions of knowledge-wh, the intellectualist position that knowledge how ascriptions are ascriptions of knowledge-wh entails that we should not expect to find many compelling examples of

Gettier cases for ascriptions of knowing-how. The alleged paucity of such cases is, if anything, evidence for, rather than against, the Intellectualist position.[10]

4. Linguistic Detail

Stanley and Williamson propose a thesis about the nature of knowing-how; they do not only make claims about sentences that ascribe knowledge-how. According to them, all of the reasons that have been given for rejecting propositional knowledge accounts of knowledge how can be accommodated by their view of its fundamental nature. But their view gains support from the fact that it is simple to sketch a compositional semantics for sentences that ascribe knowing how that assigns them the truth-conditions given in their analysis. Furthermore, it is possible to do so by following some rather standard proposals about the structure and meaning of sentences ascribing knowing how.

The folk notion of knowing-how is what the folk express when they say things like "John should go to the store, since he knows how to drive", or "John knows how to cook risotto, so ask him to show you." If Stanley and Williamson's proposal is correct, the folk notion of knowing how, the one we ordinarily express by sentences of the form "X knows how to F", is the notion of knowing how that philosophers and cognitive scientists have found of significant explanatory use. For those who hold that folk-psychological concepts such as belief and desire have proven useful in practice because they track theoretically important kinds, this is a welcome result. It shows that the folk notion of knowing-how is sufficient for theoretical purposes. For example, we need a notion of knowledge that is consistent with the knower lacking certain verbal abilities, including the ability to describe various propositional constituents. It turns out that the ordinary notion of knowledge is just such a notion.

In this section, I describe very briefly some of the details of the syntax and semantics of knowing-how ascriptions, to explain why Stanley and Williamson's analysis of the nature of knowing-how is identical with the folk notion. In so doing, I choose one standard account of the syntax of embedded questions in which to present the proposal.

According to this account, embedded questions with infinitives have the structure given in the sentences below:

(5) Hannah knows [why PRO to vote Democratic t]
(6) Hannah knows [how PRO to vote Democratic t]
(7) Hannah knows [when PRO to vote Democratic t]

The distinctive features of such constructions are that they involve (a) a question word, (b) an unpronounced pronoun, PRO, and (c) an infinitive. The question words "why", "how", and "when" originate from the positions marked by 't', which is what linguists call the *trace* of the movement of the question words. Stanley and Williamson arrive at their semantics for ascriptions of knowledge-how by combining a natural semantics for questions with one standard treatment of PRO and one standard analysis of the meaning of infinitives.

It is important to bear in mind that the literature on the topics (a)-(c) in syntax and semantics is vast and vexed. So some idealizations are in order. But note that all the Intellectualist must show is that *the same general analysis is called for in all three cases*. The sentences in (5) and (7) are ascriptions of propositional knowledge. All the intellectualist must show is that whatever complications exist for the semantics of embedded questions, the nature of PRO and the interpretation of infinitives do not entail that (6) should be given a distinct analysis than (5) and (7). Some linguists do not accept the existence of PRO. There is also no one unique standard analysis of the semantics of embedded questions. But none of these issues are relevant for the opponent of the Intellectualist Legend. None of them help her establish a disanalogy between (5) and (7), on the one hand, and (6), on the other. They all concern the analysis of constituents that are *common* to all three constructions. One who rejects the existence of PRO nevertheless thinks that there is a common syntax in (5)-(7); it is just that it does not involve PRO. Different views of the semantics of embedded questions all agree that the constructions in (5)-(7) call for the same analysis. Since (5) and (7) uncontroversially involve the ascription of propositional knowledge, these analyses all agree that (6) does as well.

The only way for the opponent of the intellectualist legend to appeal to different analyses of the semantics of questions, the nature of PRO, or the infinitive is to show that

there are views that classify (6) differently from (5) and (7). The opponent of the intellectualist legend must show that there is an account of the semantics of embedded questions that treats (6) differently from (5) and (7). But all of (5)-(7) contain the same constituents, differing only the presence of the question word "how" rather than "why" or "when", making this task all the harder.

The basic structure of semantic proposals for embedded questions has remained the same from work done by Hintikka and Hamblin in the 1960s and early 1970s, through to the most contemporary proposals. One well-known analysis is due to Groenendijk and Stokhof (1982, 1984). As with every proposal in the literature, there are features of their analysis that are controversial. Furthermore, like almost all linguistic semantic theories, it is couched in a framework that takes propositions to be functions from possible worlds to truth-values, rather than the 'structured proposition' approach favored by many philosophers who work on the semantics of propositional attitude contexts.[11] But these features are independent of any putative distinctions between (5) and (7), on the one hand, and (6), on the other. I will begin by showing how Groenendijk and Stokhof's influential analysis entails that the folk notion of knowing-how is the same as Stanley and Williamson's. I then turn to a somewhat simplified version of that semantics, which I will use as the basis for the rest of the paper.

Consider the embedded question constructions in (8) and (9):

(8) John knows who walks t.
(9) John knows how Bill walks t.

Take (8) first. On the G & S proposal, 'who' is semantically vacuous. Where 'j' is a variable over possible worlds, 'who walks t' denotes in the first instance, the property $\lambda j \lambda x(walks(j)(x))$, a function from possible worlds to properties. Given a possible world as argument, this yields a function of type <e,t>, which takes an object to the true if and only if that object is one of the walkers in j. So, in the first instance, 'who walks' in (8) denotes (10):

(10) $\lambda j \lambda x(walks(j)(x))$

The next step in G & S's theory involves a type-shift from the semantic value given in (10) to the semantic value in (11):

(11) $\lambda j \lambda i[\lambda x[walks(j)(x)] = \lambda x[walks(i)(x)]]$

The denotation in (10) is a function from possible worlds to *properties*. The denotation in (11) is a function from possible worlds to *propositions*. The type shift from (10) to (11) therefore shifts a function from possible worlds to properties to a function from possible worlds to propositions. On G & S's theory, this type shift is not induced by any expression in the sentence. Rather, the type-shift is induced *by the construction itself*.

The sentence in (11) denotes a function from possible worlds to propositions, which is the semantic value of an embedded question. Given a possible world j, it denotes that proposition that takes a possible world to the true if and only if the set of walkers in that world is the same as the set of walkers in the world of evaluation j. (8) is true relative to a world j if and only if in j, John knows that proposition. That is, (8) is true relative to a world j if and only if John knows the proposition that is the result of saturating the first argument place in (11) by the world j. So, G&S's semantics predicts that (8) is true relative to a world j if and only if in world j, John knows a proposition that is true in all and only those worlds in which the walkers are the walkers in j (whoever they may be).

Suppose that the actual world is the world of evaluation, and Andy and Susan are the two actual walkers. Then, on Groenendijk and Stokhof's theory, (8) is true in the actual world if and only if John stands in the knowledge relation to the semantic value given in (11) in the actual world. John stands in the knowledge relation to this function from possible worlds to propositions iff he knows a proposition that is true in a world iff the walkers in that world are the same as the actual walkers, i.e. the walkers in that world are Andy and Susan.

Consider now example (9):

(9) John knows how Bill walks t.

On the G&S proposal, 'how' is semantically vacuous.[12] The embedded question 'how Bill walks t' denotes, in the first instance, λjλw(walks(j)(Bill)(w)), a function from possible worlds to properties. Given a possible world j, this function yields *a property of ways*. Given a possible world j, it takes a way of doing something w to the true in j if and only if w is a way in which Bill walks in world j. The construction then induces a type shift from (12) to (13):

(12) λjλw(walks(j)(Bill)(w))
(13) λjλi[λw[walks(j)(Bill)(w)]=λw[walks(i)(Bill)(w)]]

The formula in (13) denotes a function from possible worlds to propositions. Given a world j, it yields a proposition that takes a world to the true if and only if the ways in which Bill walks at that world are the ways in which he walks in world j. So, on this account, (9) is true at a world j if and only if John stands in the knowledge relation to this semantic object at j. John stands in the knowledge relation to (13) at a world j if and only if John knows the proposition that is true at a world w iff the ways Bill walks at w are the ways he walks in j. In short, (8) is true iff John knows, of every way that Bill actually walks, that Bill walks in that way and that he doesn't walk in any other way.

Embedded question constructions such as (8) and (9) allow both *mention-all* and *mention-some* readings.[13] According to the mention-all reading of (8) (derived above), where the actual world is the world of evaluation, John knows who walks if and only if John knows a proposition that is true in a world if and only if *everyone* who walks in that world actually walks and vice-versa. According to the mention-some reading of (8), where the actual world is the world of evaluation, John knows who walks if and only if John knows a proposition that is a true in a world if and only if *someone* who actually walks also walks in that world. The natural reading of most embedded question constructions involving finite clauses, such as (8) and (9), is the mention-all reading. Mention-some readings are somewhat more natural for embedded question constructions containing infinitives. The natural reading of (14), the standard example of a mention-some reading of an embedded question construction, is the mention-some reading:

(14) John knows where to buy an Italian newspaper.

According to the mention-some reading of (14), it is true if and only if there is some place p that is a place to buy an Italian newspaper, and John knows that p is a place to buy an Italian newspaper. On the mention-some reading of (14), there is no requirement that John knows of every place that is a place to buy an Italian newspaper, that it is a place to buy an Italian newspaper (as is required by the mention-all reading of (14)). In general, embedded questions with infinitives seem to favor mention-some rather than mention-all readings.[14]

According to the mention-some reading of (8), it is true if and only if there is someone who walks such that John knows, of that person, that she walks. To derive this reading in the semantics, Groenendijk and Stokhof type-shift from 'λjλx(walks(j)(x))' to a more complicated semantic value than just a proposition.[15] The end result of combining this more complicated semantic value with their semantic clause for "know" is that, where the world of evaluation is the actual world a, (8) is true iff:

(13) $\exists x([\text{walks}(a)(x)] \,\&\, (\text{John knows that } \lambda i[\text{walks}(a)(x)] = \text{walks}(i)(x)])$.

In other words, (8) is true if and only if there is an actual walker x such that John knows that proposition that is a true at a world if and only if x walks in that world. More simply, (8) is true if and only if there is some actual walker x such that John knows that x is a walker. Turning now to (9), where the actual world is the world of evaluation, (9) will be true, on the mention-some reading, if and only if there is some way w in which Bill actually walks such that John knows that w is a way in which Bill actually walks.

According to Groenendijk and Stokhof's proposed semantic account of mention-some readings of embedded questions, embedded questions are assigned a very complex semantic value. Though they do not elaborate on their choice of semantics (preferring on their official account to consign mention-some readings to pragmatics), it is fairly clear that G&S do this to avoid providing two distinct lexical entries for question-embedding verbs, one for mention-all readings and the other for mention-some readings. In contrast, I prefer an account that assigns a simple semantic value to the embedded question, and incorporates a distinct lexical entry for the question-embedding verb, under a mention-

some reading.[16] So that is the account I will adopt for the rest of the paper. The mention-all reading of an embedded question is given by the G&S semantics. But 'know', when it occurs with an embedded question with a mention-some reading, has a somewhat different semantics.[17]

Consider (14) again, on its mention-some reading:

(14) John knows where to buy an Italian newspaper t.

The initial semantic value for 'where to buy an Italian newspaper t' is the function:

(15) λjλx(John could buy an Italian newspaper(j)(x)).

This is a function from a world to that property that is true of a thing at that world if and only if it is a place at which John could buy an Italian newspaper at that world. On the G&S semantics, (15) then undergoes a type-shift to a proposition level semantic value (for mention-all readings) and a much higher type semantic value (for mention-some readings). In contrast, I propose accepting G&S's semantics for mention-all readings, and introducing a new lexical item, "know$_{\exists}$" for mention-some readings, with the following semantics (where "Know$_{\exists}$" relates persons, possible worlds, and embedded question semantic values, which are functions from worlds to properties):

Know$_{\exists}$ (A, i, f) iff $\exists$x [f(i)(x) = t & A knows that f(i)(x) = t].

On this semantics, like on G&S's semantics, (14) is true at a world i iff for some place p, John knows, at world i, that he could buy an Italian newspaper at p. In contrast to mention-all readings, no type-shift is required to generate the right semantics – the function from worlds to properties that is the original semantic value of the embedded question is the final complement of the question-embedding verb.

Applying the foregoing to constructions such as (15) is straightforward:

(15) John knows how to ride a bicycle.

According to either of the semantic proposals I have given, on the mention-some reading of (15), where the actual world is the world of evaluation, it is true if and only if for some way w, John knows that he could ride a bicycle in way w. Prescinding from issues concerning modes of presentation, which tend not to engage linguists, this is just Stanley and Williamson's analysis of the nature of knowing-how.[18]

So, we have seen one independently motivated semantic theory for embedded questions predicts that ascriptions of knowing-how express Stanley and Williamson's analysis of knowing-how. This of course does not show that Stanley and Williamson are correct about the nature of knowing-how. It could very well be that the folk notion of knowing-how, what is expressed by *ascriptions* of knowing-how, diverges from some technical notion of knowing-how that has proven useful in philosophy and psychology (though this is certainly not what Ryle argued). But in so far as it is the folk notion of knowing how that is appealed to in ordinary explanations of skilled action, it appears to be the Intellectualist notion of knowing-how that is at issue.

According to the Rylean, knowing-how is a relation that holds between a person and an action-type. It is distinct from *knowing*, which is a relation that holds between a person and a proposition. I have argued that the neo-Rylean thesis is at the very least superficially implausible. First, it appears that knowing how to F is in a family of mental states that include knowing where to F, knowing why to F, knowing when to F, etc., states that involve the normal knowing relation, together with an embedded question. Secondly, it is presumably no accident that expressions of knowing-how involve the same verb as expressions of knowing-that. Insofar as one may seek to defend an analysis of the nature of knowing-how that aligns it with the folk notion, the evidence appears to be against the Rylean.

However, the linguistic evidence is in fact more equivocal than it appears to be at first glance. In fact, there is a possibility that the superficial implausibility of the neo-Rylean thesis is due to vicissitudes of the English language, a point that has been made particularly vivid by Ian Rumfitt (2003). In the remainder of the paper, I will allay these worries, by showing that the linguistic variation associated with knowing how is

consistent with, and indeed in the end supports, the view that knowing how is definable in terms of knowing that.

5. Knowing-How across Languages

There are at least four ways in which languages translate English "knowing how" constructions. First, there are languages that are English-like, such as Afrikaans, in which knowing-how constructions are obviously embedded questions (the Afrikaans infinitive is formed by "om te" + Verb):

(16) John knows how to ride a bicycle.

Jan weet hoe om fiets te ry.
John knows how bicycle to ride.

(17) John knows how to swim.

Jan weet hoe om te swem
John knows how to swim

(18) John knows how to cook risotto.

Jan weet hoe om risotto te kook
John knows how risotto to cook

(19) John knows that Barack is the nominee.

Jan weet dat Barack die genomineerde is.
John knows that Barack the nominee is.

In Afrikaans, one can use a bare infinitive after “weet”, but, as in English, it does not express knowing how, but rather expresses (21):

(20) Jan weet om fiets te ry.

John knows bicycle to ride.

(21) John knows that he ought to ride a bicycle.

Secondly, there are languages such as French, in which know-how often is naturally expressed with the use of the bare infinitive.[19] For example, in French, (22) is translated with the use of the bare infinitive “nager”, as (23) rather than (24):

(22) Pierre knows how to swim.
(23) Pierre sait nager.
(24) ? Pierre sait comment nager.

Third, there are languages like Chinese and Russian, in which it is far more natural to use a verb other than the propositional knowledge verb to translate a sentence like (22):

(25) Я умею плавать.
I know how to swim

Fourth, there are languages such as German that do not allow infinitives (such as the direct translation of “to swim”) to occur in embedded questions at all (Wurmbrand, 2001, p. 107). These languages (which include Swedish as well) do not provide direct translations for any of the sentences in (1).[20]

We have seen the intellectualist accounts for languages such as English and Afrikaans. In what follows, I will show that the intellectualist can smoothly account for the data in languages in which the propositional knowledge verb appears to take a bare infinitive in expressing knowledge how. I conclude by discussing languages in which knowing-how is expressed with a distinct verb, such as Russian and Chinese.

6. The Linguistic Argument against Intellectualism

The most immediate challenge raised by languages such as French that appear to express "know how + infinitive" without a question word is as follows. In order for knowing how ascriptions to express Stanley and Williamson's analysis of the nature of knowing-how, the complement of "know" in constructions such as (22) must denote the semantic value of an embedded question, namely a function from possible worlds to propositions. But there is no overt question word in (23). So it appears that the complement of "savoir" in (23) cannot be an embedded question, since it contains no question words. So either (23) (implausibly) does not provide a translation of (22), or the complement of "know" in (22) does not after all denote the semantic value of an embedded question. But if the complement of "know" in (22) does not denote the semantic value of an embedded question, then (22) is not a propositional knowledge ascription.

It is worthwhile making the structure of this argument against Intellectualism explicit:

<u>Linguistic Argument against Intellectualism</u>
(a) "Pierre sait nager" is the translation of "Pierre knows how to swim"
(b) In "Pierre sait nager", "savoir" takes an infinitive complement.
(c) The translation of "sait" in "Pierre knows how to swim" is "knows how".
(d) "sait" in "Pierre sait nager" is a single constituent.
(e) "knows how" in "Pierre knows how to swim" is a single constituent (from (c) and (d))
(f) "knows how" in "Pierre knows how to swim" is a single constituent that takes the infinitive complement "to swim" (from (e) and (b) and (c)).
Therefore: In English, "knows" as it occurs in constructions such as "John knows how to ride a bicycle" does not ascribe propositional knowledge.

However, the linguistic argument against Intellectualism is not valid. Even if all the premises were true, the conclusion would only follow if, to give the embedded

question semantics for a construction, one needed to appeal to a question word in the syntactic structure of the sentence under analysis. But on many accounts of embedded questions, one can obtain the embedded question semantics without a question word. Consider Groenendijk and Stokhof's original semantics, either for the mention-all or the mention-some readings of embedded questions. On this account, the question word is semantically vacuous. An embedded question denotes, in the first instance, a property. The construction then induces a type-shift, either to a proposition-level semantic value (in the case of mention-all readings) or to a higher-type semantic value (in the case of mention-some readings). In both cases, the semantic type before the type-shift is a property. Nothing in the semantic derivation of the meaning of an embedded question depends upon the presence of a question word, either overtly or covertly.

Here is one way to obtain the embedded question semantics for examples such as (23) using the second account of mention-some readings sketched in the previous section. The structure of a sentence such as (23) involves two unobvious elements. First, it is relatively uncontroversial that the infinitive "nager" in (23) contains an occurrence of the unpronounced pronoun PRO in its subject position. Secondly, I will suppose that (23) contains a free manner variable as well. So the syntactic structure of (23) is as:

(26) Pierre_i sait PRO_i nager x.

The complement of (26) therefore expresses (27), a function that takes a possible world to the property of being a way in which Pierre could swims in that world:

(27) $\lambda j \lambda x$(Pierre could swim in way x)

Combining this with the semantics described in the previous section, we obtain the correct truth-conditions for (23) relative to a world w:

(28) $\text{Know}_{\exists}$ (Pierre, w, $\lambda j \lambda x$(Pierre could swim in way x)) iff $\exists x$ [Pierre could swim in way x in world w & Pierre knows that Pierre could swim in way x in world w].

So, without any question word occurring either overtly or covertly, it is simple to give the embedded question semantics for languages in which knowledge how is expressed with a bare infinitive. That is, one can easily give an embedded question semantics to verbs that take bare infinitive complements. So even if we take the apparent structure of languages such as French at face value, one can easily give an intellectualist account of their ascriptions of knowing how.

But unlike the English verb "learn", where we do not perceive a difference in use between "learn how to F" and "learn to F", French speakers do perceive a strong difference in use between "savoir + infinitive" and "savoir comment + infinitive". One would use the latter construction to communicate that a person has a discursive description of a way of doing something, and in addition, lacks a practical mode of presentation of that way. If "Il sait nager" attributes knowledge of the same proposition as "Il sait comment nager", why should there be such a difference in use?

The answer is that general pragmatic facts explain how this difference in usage (and perhaps also semantic content) came to arise. The explanation follows from Paul Grice's conversational *maxim of manner* (Grice, 1989, p. 28), which states that one can "expect a partner to make it clear what contribution he is making and to execute his performance with reasonable dispatch". In French, it has become typical to use only the bare infinitive to express knowing-how. Therefore, pronouncing the question word becomes a useless addition – someone who does so has not chosen "to execute his performance with reasonable dispatch". Grice's maxim of manner would therefore predict that use of the overt question word would be a pragmatic violation. Like other pragmatic violations, it would be employed to convey something over and above the propositional content. Over time, this implicature has become conventionalized. In the case of French, the implicature associated with the use of "comment" seems to be that the person has a discursive mode of presentation of a way of doing something. That is, Grice's maxim of manner explains how the use of "comment" in French has become a conventional way of indicating that the mode of presentation associated with the construction is a descriptive mode of presentation of a way, rather than a practical one. If modes of presentation are part of the semantics of propositional attitudes generally, then the use of "comment" indicates that the semantics involves a descriptive rather than a

practical mode of presentation of a way of doing something; Grice's maxim of manner provides an explanatory account of how this has come to be.

Grice's maxim of quantity ("assert the stronger") also explains why use of "savoir comment + infinitive" tends to communicate that the person lacks a practical mode of presentation of a way. People with verbal abilities who know how to do something are often able to give some sort of description (perhaps in demonstrative or indexical involving terms) of the way in which they do it. As a result, in a number of cases, saying that someone knows how to swim would normally suggest (but of course not entail) that they could give you a description of the way in which they do it. But there is no such normal connection between having a description of a way of swimming, and having a practical mode of presentation of that way. Given these facts about the world, "Il sait nager" is generally a more informative assertion than "Il sait comment nager". So if a French speaker says "Il sait comment nager", they generally communicate that the person in question *only* has a discursive way of thinking about a way of swimming, since they deliberately choose the weaker statement to assert, and by Grice's maxim of quantity, implicate that the stronger statement is false.

So giving an Intellectualist semantics for languages in which the translation of "know" takes an infinitive complement is straightforward. Furthermore, the intellectualist has clear explanations of all the facts about usage in such languages. The Linguistic Argument against Intellectualism is invalid. In the next section, I will show that in English, "knows how" is not a single constituent, and therefore that step (e) is also false; use this fact to argue that the best theoretical account of ascriptions of knowing how in English-type languages and French-type languages is that our folk notion is Intellectualist in character.

7. "Knows how to F" contains an embedded question

We have seen how to give an embedded question *semantics* even if "know" takes a bare infinitive complement. So even if "knows how" were a constituent, with "to swim" its complement, it could still be a propositional knowledge ascription. But "knows how" in English is not in fact a constituent, and "how" is in fact a genuine question word. So

languages such as French do not show us the true syntactic structure of English knowing-how attributions.

In English, it is clear that in "knows how + infinitive", the occurrence of "how" is a distinct question word, and not part of the verb "know". For example, one can conjoin "how" with other question words, as in:

(29) An airman knows how and why to achieve essentials such as air superiority. (From "Air Force Doctrine and Leadership", *Aerospace Power Journal* (Summer, 2001).
(30) Make sure your whole family knows when and how to call emergency telephone numbers. (from the FEMA website: http://www.usfa.dhs.gov/citizens/all_citizens/home_fire_prev/alarms/
(31) You will enjoy the safety of travelling with a knowledgeable local, who knows where and how to find the birds you want to see. http://www.birdingpal.org/tours/

If "know how" were a constituent in "know how + infinitive", none of these constructions should be possible. Finally, the following inference is valid:

(P1) John knows how to surf.
(P2) John knows when to surf
(C) John knows when and how to surf.

But if, in (P1), "knows how" were a single constituent, then this inference would not be valid.

It is true that "how" has somewhat different syntactic behavior than other question words. As (32) shows, the question word "how" permits some wh-words to take scope over it that are blocked by its close cousin "when":

(32) What does John know how to do?
(33) * What does John know when to do?

One might be tempted to use these facts to support the case that "know how" is a constituent in English in ascriptions of knowing how such as (15) and (22). But this would be mistaken.

First, “know how” in such constructions is in fact a scope island. For example, “how” prevents quantifiers from taking scope over it. There is no de re reading of the indefinite “a mountain” in (34). The first sentence of (34) can only be read as attributing to John knowledge of how to climb mountains. In contrast, (35), which does not contain a question word, clearly allows a de re reading, as is evidenced by the fact it supports singular anaphora:

(34)* John knows how to climb a mountain. It is over there.
(35)John plans to climb a mountain. It is over there.

Though “how” does not have the same properties as other scope islands, allowing more phrases to move over it, it is a scope island nevertheless.[21]

Secondly, “how” differs in this manner from other question words such as “why” and “when” in all of the constructions in which it occurs, as attested by the facts in (40-45):

(36)What does John wonder how to do?
(37)*What does John wonder why to do?
(38)What did John figure out how to do?
(39)* What did John figure out why to do?
(40)What did John ask how to do?
(41)*What did John ask why to do?

So unless the Rylean is prepared to argue that there is a non-propositional sense to all question-embedding verbs, akin to her non-propositional sense of “knows”, she cannot use this difference between “how” and other question words in support of her claim.[22]

In this section, we have seen that English knowing-how constructions are, as they appear to be, embedded question constructions. So we have languages such as French, in which the propositional knowledge verb takes as a complement something that is not syntactically an embedded question, and we have apparent translations of those sentences into English, in which the propositional knowledge verb takes as a complement something that is syntactically an embedded question. Finally, we have languages in which it is most natural to translate a sentence like “John knows how to ride a bicycle” with the use of a verb that is not the propositional knowledge verb. In the next section, I

will argue that the best overall account of the cross-linguistic data is given by the Intellectualist.

8. The Intellectualist Legend Sustained

One natural way for the Rylean to use the cross-linguistic data is to use French to argue that, in English, "knows how" is in fact a single verb with an infinitive complement. But in the previous section, we have seen that in English, "knows how" is not a single verb. So in order for the Rylean to exploit languages like French to argue that English ascriptions of knowing-how are not Intellectualist, she must argue for a very strong ambiguity thesis. The Rylean must argue that the English verb "know", and the French word "savoir", as well as their cognates in many other languages, are *ambiguous* between the propositional knowledge verb, and a verb attributing a distinct cognitive state, which is an attitude towards an action-type. Perhaps the Rylean could then bring in languages such as Cantonese and Russian, in which knowing-how ascriptions are naturally translated with the use of a different verb, in favor of her ambiguity thesis.

In contrast, the Intellectualist does not require an ambiguity thesis to make sense of the cross-linguistic pattern of data. As we have seen in Section 6, it is easy for the Intellectualist to give a compositional semantic account for knowing-how attributions in languages that express them without overt question words. For the Intellectualist, "savoir", like "know", only has those meanings required to account for propositional knowledge attributions, including those of the embedded question variety. It has no additional meanings. So the Intellectualist can easily account for languages in which "know how + infinitive" is translated with the propositional knowledge verb together with the infinitive. She can do so without postulating any additional ambiguities for the propositional knowledge verb.

But what about languages like Cantonese and Russian, that employ verbs other than the propositional knowledge verb in the translation of sentences like "John knows how to swim"?[23] In fact, I think some recent evidence about speakers of such languages provides evidence for the Intellectualist position. In a recent paper, Twila Tardif, Henry Wellman, and colleagues explore grasp of the knowing-how concept among English

speaking and Cantonese speaking toddlers. What they found, contrary to expectation, was that both English speaking and Cantonese speaking toddlers understand what it is to know how to do something significantly *after* they master the concept of propositional knowledge. As they write:

> When beginning these studies, we fully expected that children's understanding of knowledge might be better for knowing-how than for knowing-that and that this might be especially pronounced for Chinese speaking children. Indeed, the results for knowing-that were not the same as those for knowing-how. However, counter to our initial thoughts on this, children's judgments of themselves or others were less accurate when the information and judgment concerned knowing how. Moreover, we found no evidence in either Study 1 or Study 2 that the development of these understandings begins at different times in the two cultures that we examined. This is despite the fact that English-speaking children use the same word ("know") to refer to both knowing-that and knowing-how early on in their everyday conversations, whereas Cantonese-speaking children use distinct terms for "knowing-that" and "knowing-how". In particular, in Hong Kong just as in the United States, children were less able to judge whether a person knows how to do a simple task than they were to judge whether a person knows the contents of an unmarked container. (Tardif, Wellman, et. al. (2005))

Intellectualism about knowing-how provides a straightforward explanation of these developmental results. Grasping what it is know how to do something involves understanding what it is to know the answer to a question. As we have seen, this is an ability that presupposes mastery of propositional knowledge. Therefore, Intellectualism predicts that one must first have facility with the concept of propositional knowledge before one masters knowledge-wh. So these results are to be expected, if Intellectualism is correct. In contrast, if the concept of knowing how is an utterly different cognitive state than propositional knowledge, it would be a mystery why mastery of it must be preceded by mastery of the concept of propositional knowledge.[24]

One might wonder why there are languages in which "know how + infinitive" is translated with a different word than the propositional knowledge verb, if it is analyzed in terms of it. It does not seem, for example, that there are languages in which "know who + infinitive" is translated with a different verb. But an alternative explanation is ready to hand. "How" is the only question word that is optionally pronounced in embedded question constructions across languages. The fact that some languages employ a different

verb to translate "know how + infinitive" may simply be a reflection of this purely accidental grammatical fact about "how".[25]

The Intellectualist can smoothly account for all the cross-linguistic data involved with ascriptions of knowledge-how. Furthermore, she can do so without postulating ambiguities in "know" and its various translations, and while explaining some mysterious developmental facts.

Conclusion

Most contemporary philosophers find the view that knowing how is definable in terms of propositional knowledge alarmingly radical. Perhaps one reason for this reaction is the sense that states like dispositions and abilities are in some sense prior to the capacity for propositional mental states. This thought has several manifestations. One is that what we creatures capable of propositional thought share with creatures not capable of propositional thought are dispositions and abilities. Another is that a naturalistic reduction of mentality must ultimately ground the capacity to have propositional mental states in abilities, dispositions, and capacities of the agent. One might find it natural to express such points in terms that involve "knowing how". For example, one way in which one might put the point that creatures with a capacity with propositional knowledge share something with creatures that lack this capacity is that both know how to do things. Similarly, one might characterize the desire to reduce propositional mental states in part to dispositions and abilities as the desire to reduce propositional mental states in part to knowing how. If so, one would resist the position that knowing how is to be defined in terms of propositional knowledge.

The inclination to express the foregoing in terms that invoke "know how" should be resisted. Having beliefs may presuppose the possession of capacities and dispositions; capacities and dispositions may even be more primitive than propositional mental states. But neither of these possibilities threatens the position that knowing how can be defined in terms of propositional knowledge. One would think that there is a tension here only if one antecedently identified knowing how to do something with having certain dispositions or abilities. But knowing how to do something is not simply a matter of

having certain dispositions. It is a matter of having the right propositional knowledge; of knowing the right answer to the question "how could you do it?"[26]

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[1] I have chosen this vocabulary, because Ryle thought that the view that knowing how can be defined in terms of knowing that was related to what he called 'The Intellectualist Legend', which is a thesis about the nature of intelligent behavior. As Ryle (1949, p. 29) writes, "Champions of this legend are apt to try to reassimilate knowing how to knowing that by arguing that intelligent performance involves the observance of rules, or the application of criteria."

[2] I speak throughout in terms of the *intuitive* truth or falsity of uses of these constructions, because of the desire to maintain neutrality on the issue of whether the modes of presentation relevant to the intuitive truth and falsity of uses of these constructions are part of pragmatics or are part of the semantics proper.

[3] Fodor here runs together knowing how and being able, but not in a way that detracts from his central point.

[4] It is a matter of no small controversy in epistemology whether all types of propositional knowledge are susceptible to Gettier cases. So even if there are no Gettier cases for knowing-how, that still does not show that knowing-how fails to be a species of propositional knowledge. But I will ignore this point in what follows.

[5] Several recent papers have advanced this line, for example, Poston (forthcoming), Yuri Cath (manuscript), and Elia Zardini (manuscript).

[6] One concern with the methodology of the Bengson, Moffett, and Wright paper, pointed out to me by Mary Salvaggio, is that they insert "unknowingly" into the description of the case. This may have biased the responses.

[7] One might reply to this description of the case, as an anonymous referee did, by denying that Irina intends to do the Salchow, when she thinks that she intends to do the Salchow. But the grounds for so doing are unclear. I can have an intention with a certain content, despite have false beliefs about the some of the constituents of that content. For example, someone who believes that water comes from magical fairy dust still can intend to drink some water. I can intend to ride a bicycle, even though I falsely believe that doing so requires me to kick my legs apart constantly. Analogously, someone who has false beliefs about the Salchow can still intend to perform the Salchow.

[8] Cath (op. cit.) takes (IAK) to be inconsistent with Stanley and Williamson's description of a Gettier case for knowing how, involving a deceived aspiring pilot. But this is because he thinks that in the so-described case, the person does have the ability to intentionally fly. Stanley and Williamson would simply deny this.

[9] I am particularly grateful to Blake Roeber for pressing me about these cases.

[10] Though the non-obviousness of Gettier intuitions for knowledge-how is no obstacle to the Intellectualist position, it is possible to elicit Gettier intuitions for knowing-how. Consider again Stanley and Williamson's case of Bob, whose flight instruction has been provided by a malicious imposter who has inserted a randomizing device in the simulator's controls, which by sheer chance causes the exact same results in the simulator as would have occurred without it. Do we really think that Bob, before he has ever flown a real plane, knows how to fly a plane? Suppose that we needed someone to fly a group of diplomats to a meeting to avert a genocidal war. Even if we are restricted to choosing

among members of graduating classes in flight school, and we know all the facts, it doesn't seem right to choose Bob. A perfectly ordinary explanation for our preference in this situation for graduates of flight schools with competent instructors is that they have a superior epistemic standing than Bob does; they know how to fly a plane, and he does not.

[11] One exception is Manfred Krifka, who in recent work (e.g. Krifka (2001)) has argued for a 'structured meaning' account of answers. But even here Krifka's motivation is substantially different than the motivations of philosophers who argue for structured propositions. Krifka argues that structured meanings provide a better account of the interaction of focus and correct question/answer pairs.

[12] Of course, replacing "how" by "when" results in a different proposition expressed. This is not because of differing semantic contributions of "how" and "when", but because in one case, the trace "t" has as possible values ways of walking, whereas in the other, it has as possible values times of walking.

[13] On some accounts, mention-all and mention-some readings are due to a systematic ambiguity either in the question-embedding verb or in its complement. On other theories, the mention-some reading results from some kind of domain restriction of a mention-all reading. I have chosen to frame the debate with the first sort of theory, though nothing hangs on this choice.

[14] As Lahiri (2002, p. 92, footnote 11) notes, "Existential readings…seem to be more easily available when the embedded interrogative is a wh-infinitive."

[15] According to Groenendijk and Stokhof (1984, p. 533ff.) the semantic type of a mention-some embedded question is a generalized quantifier over questions.

[16] As Stanley and Williamson (2001, p. 426 ft. 27) note, this move would also be required to modify Kartunnen's well-known theory of embedded questions to accommodate mention-some readings within the semantics.

[17] The simplest way to implement a semantic ambiguity between mention-all and mention-some readings would be to argue that a sentence like "John knows who came to the party" is ambiguous between "∀x[x is a person and x came to the party][John knows that x came to the party]" and "∃x[x is a person and x came to the party][John knows that x came to the party]". This analysis has been defended before. But it is too weak a truth-condition for mention-all readings of questions (for discussion, see Lahiri, 2002, pp. 148-51). On the other hand, the mention-some aspect of the analysis is fine. So I have preserved the mention-some aspect of this kind of analysis, and used G&S's theory of mention-all readings.

[18] On my view, no theory of the attitudes is fully satisfactory without an account of the effect of modes of presentation on our intuitive judgments about their truth and falsity. There is no special problem about making the Groenendijk and Stokhof account of questions complete in this sense (though the fact that the theory involves coarse-grained propositions, rather than structured propositions, would force one to have modes of presentation of *propositions* rather than *constituents* of propositions).

[19] Many other Romance languages follow this pattern (as does e.g. Hebrew). But there is also some dialectical variation, as there are dialects of e.g. Portuguese in which the embedded question syntax and the bare infinitive both occur with similar frequency.

[20] Finnish also allows for a natural embedded question syntax:

(a) Jussi tietää mitten ajaa pyorää
John knows how ride bicycle.
Finnish also has the verb "osaa" that can be used in such constructions, which takes a bare infinitive.
(b) Jussi osaa ajaa pyorää.
John can ride bicycle.
So Finnish is English-like in allowing natural embedded question syntax, and Russian and Chinese like in having a special verb. Hungarian, in contrast, has both a German and Swedish pattern, and a French pattern. The propositional knowledge verb "tud" when it occurs with an explicit question word such as "hogyan" ("how"), must occur with a finite clause (as in "János tudja, hogyan kell úszni", John knows how he ought to swim). But knowledge how can also be expressed by "tud" together with the bare infinitive, as in "János tud úszni".

[21] For instance, a Google search on "How many do you want to" yields over 18,000 hits. In contrast, a Google search on "How many do you know how to" yields only 21, some of which link to ungrammatical sentences containing this phrase in Luigi Rizzi's work.

[22] Also, the question word "whether" is similar in its island properties to "how" – replacing "how" by "whether" in (40), (42), and (44) also results in acceptable sentences.

[23] We may ignore languages like German, which for grammatical reasons do not allow infinitives in embedded question constructions. Germans tend simply to use the German translation for the modal auxiliary "can" in translating of English knowing-how statements. As Bengson, Moffett, and Wright (forthcoming) show, the two constructions "know how to F" and "can F" are clearly not synonymous. For example, in their envisaged scenario, Irina can perform the Salchow but does not know how to perform the Salchow. They also show that speakers recognize that someone can know how to perform the Salchow, without being able to perform the Salchow.

[24] Thanks to Jennifer Nagel for discussion here.

[25] Here are some alternative proposals. First, some of these verbs might be translations of "to be able to", rather than "know how + infinitive". Secondly, some of these verbs might be translations of the acquaintance sense of "know". For example, the Cantonese verb used in the translation of "knowing how + infinitive" is the same verb as the verb used in ascriptions of knowledge by acquaintance. If it is not ambiguous, perhaps Cantonese speakers say what we say by the locution "John knows how to ride a bicycle" by attributing to John acquaintance with a way of riding a bicycle. But on none of these alternative interpretations does Cantonese supply evidence for a distinctive practical, non-propositional sense of knowledge.

[26] I am grateful to audiences at Queen's University, University of St. Andrews, University of California at Santa Barbara, Northwestern University, and Princeton University for comments. Thanks also to discussion with Yuri Cath, Chris Collins, Sam Cumming, Jeroen Gronendijk, Adele Mercier, Daniele Sgaravetti, Twila Tardif, and Henry Wellman. Discussions with Sam Epstein, Jennifer Nagel, and Elia Zardini were particularly helpful. Numerous correspondents on linglist helped with the cross-linguistic data. An anonymous referee also improved the paper with very useful written comments. Special thanks are due to Timothy Williamson, who supplied very helpful written comments on a previous draft.