

# Knowledge-How

Topics in Epistemology  
Oxford, 3/5/12

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## 1 Recall

**Reductionism** We can analyze knowledge-wh in terms of only the knowledge relation between individuals and propositions.

**Equivalence** For any particular state of knowing-wh, there is a proposition  $p$  such that being in that state of knowing-wh just is knowing  $p$ .

Groenendijk and Stokhof [1984] propose that questions denote partitions of logical space according to complete answers. Knowing the question is just knowing which cell of the partition the actual world lies.

Hamblin [1973] treats the denotation of a question as the set of all its possible answers (where partial answers are defined in terms of substitution instances with question word). Knowing the answer is, on Karttunen's [1977] way of looking at things knowing all of the true partial answers. On all these views knowing-wh is reducible to knowing a particular proposition.

Mention-some readings:

- (1) John knows where you can buy cigarettes in Euston.

## 2 Why-questions

Last time, we focused on questions where answers are partitioned out in discrete bundles by our naive metaphysics, e.g., *Who came?* Once a domain of individuals (and a contextual meaning for *came*) is fixed the set of answers (in any of the senses above) is clear. However, not all questions are like this.

Consider *why* questions for G&S (or K). It is not easy to construct a partition of logical space based on mutually exclusive answers to *why* questions. Of course, in some cases there will be background assumptions that help us through this, but not always. Richard Feynman's qualifying exam, if

I recall correctly, consisted simply of the question *Why is the sky blue?* What partition of logical space would correspond to this question?

Hamblin's [1958] second postulate is 'knowing what counts as an answer is equivalent to knowing the question.' Is this plausible? I know what question Feynman's qualifying exam asked, but I have little idea what counts as a complete answer.

Should we treat all questions as having mention-some answers then? Or as having a pretense of a discrete space of mutually exclusive answers?

Analogous, but less severe worries arise with partitioning out time and space for *where* and *when* questions.

## 3 A different (semi)-reduction of knowledge-wh

We could try to deal with mention-some worries about reductionism and the problems with *why*-questions and other questions with less discrete answers by a less ambitious analysis (then the G+S analysis discussed last week).

Take something like a classic Hamblin [1973] semantics of questions: the meaning of a question is just its set of possible (incomplete) answers. Then we don't build into the meaning of the question any algorithmic specification of a complete answer (and hence don't face the worries about indefinability of *why*-questions, etc).

In order to deal with question embeddings we need to posit a (contextually-determined) answering relation between a proposition and a question, call this relation  $A$ .  $pAq$  iff  $p$  is true,  $p$  is logically equivalent to the conjunction of some subset of  $q$  and  $p$ , in the context, is sufficiently informative to count as an answer to  $q$ .

Then, our reductive definition of knowledge goes as follows:  $x$  knows  $q$  iff  $\exists p(pAq$  and  $xKp)$ .<sup>1</sup> When answerhood requires completeness we get the G&S reading (or the K reading for the weaker notion of completeness) otherwise we can get a mention-some reading.

This is a very loose theory, but one which can accommodate mention-some readings as well as the context-sensitivity of what counts as a complete answer to a 'why' question. It has little predictive power so needs more stipulations to capture what G&S do, and is more extravagant in requiring two notions: the notion of a question and the notion of being a contextual

<sup>1</sup>I think Higginbotham proposed this as well at some point.

answer. It's generalizing to the worst case(s)—not an attractive methodology. But, on the other hand, it might be better than pretending like difficult cases do not exist.

## 4 Infinitival Knowledge-Wh

- (2) a. John knows where to buy drugs.
- b. John knows when to buy drugs.
- c. John knows how to buy drugs.
- d. John knows who to buy drugs from.

Syntactic structure? Dominant thesis: silent subject of verb PRO (pronounced 'big pro'). So:

- (3) John knows where PRO to buy drugs.

Here PRO is interpreted as either *John* or *one* (it's not clear which one in these cases).

There's some controversy over the existence of PRO [see, e.g., Culicover and Wilkins, 1986], although it's widely accepted. Non-deeply theoretical linguistic argument for PRO (only one I can think of): reflexives must be locally bound.

- (4) John knows Mary to be eyeing \*himself/herself.
- (5) John knows how to eye himself.

(Actually this is deeply theoretical.)

Infinitival construction: interpreted with either *can* or *should*.

(Note that *why* questions require *should* interpretation:

- (6) John knows why to buy drugs = John knows why he should/\*can buy drugs.

This suggests (perhaps) all involve *should* in some way.)

We can think that infinitival knowledge-wh ascriptions are treated on par with regular ones. Thus questions of status of REDUCTIONISM and EQUIVALENCE about infinitival constructions parallel those about regular ones. Recall that for so-called mention-some readings [Groenendijk and Stokhof, 1984], EQUIVALENCE seemed unlikely: there is not some proposition  $p$  such

that one knows where you can buy drugs iff  $p$ . Infinitival questions seems (only?) to get mention-some reading, so EQUIVALENCE is out.

In addition observations by George [2011] indicate that mention-some readings even challenge REDUCTIONISM. For infinitival readings this amounts to the following problem:

- (7) John knows where to buy cigarettes.

Truth of this is not guaranteed just by John knowing that you can buy cigarettes at convenient place  $x$ . (According to George) John must also not falsely believe that one can buy cigarettes at equally convenient place  $y$ .

## 5 How

Stanley and Williamson [2001] essentially note parallels between knowledge-how attributions and other forms of knowledge-wh attributions and argue for a uniform semantic analysis (assuming REDUCTIONISM is part of such an analysis). Thus we expect to treat (8) on par with (7).

- (8) John knows how to smoke a cigarette.

What distinctive issues are raised by knowing-how? For one thing a long philosophical pedigree, starting(?) with Ryle [1949, ch. 2]. Ryle propounded against INTELLECTUALISM which is often understood as REDUCTIONISM about knowledge-how. Ryle can seem a little dated, and Stanley and Williamson [2001] rightly criticize his regress argument.

### 5.1 What Mary Didn't Know How

Let me give a version of Jackson's "knowledge argument" argument about color experiences for non-reductionism about Knowledge-How.<sup>2</sup>

Mary is a brilliant scientist kept away from ski-slopes her entire life by her callous parents. She develops a full mastery of all the sciences, including physiology and neurobiology . . . . Mary

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<sup>2</sup>Note this is very different from the uses made of this argument by Stanley and Williamson [2001]. I find this part of the paper extremely perplexing as it seems in tension with much that comes before.

knows all about the skiing, but when she finally goes to Aspen, she learns something new, namely how-to-ski. But since she was already taught all the relevant propositions about skiing, knowing how to ski cannot reduce to knowing some propositions.

I suppose this relies on an empirical claim. Let's just grant this, as it's plausible.

The argument, I hope, does not work (as easily) with other knowledge-wh expressions.

However, note parallels to familiar arguments in *de se* literature. John can read all about geography and the placement of people, but still not know where he is. Still there is some information John must not have gotten (e.g. first-personal information). Not clear anything similar can be said about *information* not conveyed to Mary in example above.

## 5.2 Question Response

Another claim: For any other knowledge-wh attribution a sufficient if not necessary condition for knowing the answer to a question is to be able to respond to the question by a (spoken) true proposition which you know. Not so for knowledge-how attributions.

(Actually a bit dubious when you think of where-is questions for *de se* type considerations.)

## 5.3 Inferential arguments

The following inferences seem okay:

- (9) For every shop  $x$ , if  $x$  sells cigarettes John knows that, and if  $x$  doesn't sell cigarettes John knows that.  
 $\rightsquigarrow$  John knows where to buy cigarettes.

But what about "should" readings:

- (10) For every person  $x$ , if we should invite  $x$  John knows it, and if we shouldn't invite  $x$  John knows it.  
 $\rightsquigarrow$  John knows who to invite.

But what about with knowledge how.

- (11) For every way  $x$ , if one/John can sky in way  $x$ , John knows it.  
 $\not\rightsquigarrow$  John knows how to ski.
- (12) For every way  $x$ , if one/John should sky in way  $x$ , John knows it.  
 $\not\rightsquigarrow$  John knows how to ski.

At least on most prominent reading of *how to ski*, though it seems like there are readings available on which these inferences come through.

## 5.4 Brute intuition

What you know when you know how to ski doesn't seem like a proposition (or a set of them). Maybe this intuition is just based in the kind of considerations above, or maybe there are independent reasons for it.

## 6 Linguistic Argument

We saw, in previous section, some fairly serious considerations against treating knowledge-how as propositional knowledge.

Stanley and Williamson [2001] argue that the semantic uniformity of knowledge-wh constructions including knowledge-how supports a propositional treatment of knowledge-how. They write:

We take our view of knowledge-how to be the default position. From a linguistic perspective, very little is special about ascriptions of knowledge-how. It is hard to motivate singling them out for special treatment from the rest of a family of related constructions. Our view of ascriptions of knowledge-how is the analysis reached on full consideration of these constructions by theorists unencumbered by relevant philosophical prejudices.

Besides the overall semantic framework for questions we have discussed, there are also considerations about conjunctions of attributions:

- (13) John knows that Tom is the chairman and how to get in touch with him.
- (14) John knows where and how to party.

(Are these zeugmatic?)

## 7 Guises to the rescue?

Stanley and Williamson recognize (even if they don't acknowledge) the surface implausibility of treating knowledge-how attributions as species of knowledge-that. Luckily their bag of tricks is not exhausted by mainstream linguistic semantics.

They propose that knowledge-how attributes are conventionally associated with propositional knowledge under a "practical mode of presentation".

This is the not-so-secret ingredient in their account as it allows them to explain the disanalogies between standard propositional knowledge and knowledge how that we listed in Section 5.

Their argument (p.428) for such modes of presentations is essentially dependent on believing their account. Essentially, they note that it's possible for (15) to be true while (16) is false.

(15) Hannah knows that that way [pointing to John] is a way for her to ride a bike.

(16) Hannah knows how to ride a bike.

We used this sort of consideration earlier to argue that knowledge-how is *not* a form of propositional knowledge. However, they use it to argue for a special mode of presentation necessary for knowledge-how.

They analogize with *de se* ascriptions:

(17) John wants to win the election.

(18) John wants him to win the election.

Essentially requiring that knowledge-how attributions always attribute knowledge under practical guises provides a blank check for explaining a) relations between knowledge-how and abilities, and b) lack of inferential relations between knowledge-how and knowledge-that.

They argue their case is on par for the case from *de se* ascriptions to *de se* modes of presentation. (Much complication here as we do not have an alternative view of *de se* presented to us here.)

## 8 Against the linguistic argument

However, as Rumfitt [2003] notes, the linguistic argument is not as strong as S&W make it out to be. In French (and other Romance languages) knowledge-how is expressed without a complementizer.

(19) Jean sait parler.  
Jean knows how to talk

It is not at all clear that we should think there is a silent complementizer here, or some other semantic device for quantifying over ways, rather than a special construction for attributions of a special kind of knowledge. Most instructively, we can say things like (20) only if there is something proposition-like in the knowledge of how to do this (e.g. Jean knows to peel it first, core it, then cut it into slices).

(20) Jean sait comment manger les pommes de terre.  
Jean knows how to eat apples.

Thus it seems that French marks off as special know-how in a way in which English does not, thus undermining Stanley and Williamson [2001].<sup>3</sup> In addition the following is extremely zeugmatic in French:

(21) ??Jeanne sait que Pierre est important et parler avec lui.

Indeed, even in English we seem to have a bare-infinitive kind of attribution of know-how. As Glick [2011] points out *learn* in English seems take bare infinitive:

(22) John learned to swim  
↔ John learned how to swim and John knows how to swim.

While I take it there is a use of *know how to swim* in which merely propositional knowledge about swimming might suffice, it seems like there is no use of *learn to swim* in which success can be constituted by learning the propositions without picking up some of the capacities (modulo weird cases where capacities are masked).<sup>4</sup> Even more interesting are languages that Rumfitt discusses like Russian and Chinese. In both these languages

<sup>3</sup>See Stanley's [2011] response to Rumfitt for very interesting example of making the best of a bad hand.

<sup>4</sup>Compare:

knowledge-how is ascribed using a different verb from that used to ascribe propositional or interrogative knowledge. (As far as I know, which is not very, no languages use different verbs for knowledge-wh generally versus knowledge-that).

## 9 Capacities/Dispositions

Ryle and others have argued or assumed that knowledge how can be analyzed in terms of dispositions or capacities. These analyses face serious worries.

What should a default hypothesis about the nature of knowledge-how be? Presumably that it is a mental state with connections to certain capacities. One knows how to drive if and only if one is in certain kind of mental state. Surely arguing that knowledge-how is not knowledge-that does not commit one to a reduction of knowledge how to something else. (Though perhaps knowledge-how is a sort of mental capacity.)

## 10 Putting the pieces together. . .

We have two (related questions) which we have not satisfactorily answered:

1. What is the relation between canonical states of know-how (e.g. knowing how to drive, how to make coffee, not how Napoleon died) and propositional knowledge.
2. What is the correct semantic analysis of English sentences like *John knows how to drive*.

S&W essentially answer 2. first by reference to standard semantics for embedded semantics and say that forces us to claim that states of know-how are states of propositional knowledge. Then they bite the bullet and introduce sui-generis modes of presentation to avoid the more absurd consequences of their view.

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- (i) a. ?In physics class I learned to build a nuclear bomb.  
b. In physics class I learned how to build a nuclear bomb.

It seems like the learn-to construction is highly specialized.

The other direction: argue that canonical states of know-how are not propositional knowledge, and then that English knowledge-how attributions are at best ambiguous. Rumfitt [2003] suggests as a possibility the view that English knowledge-how attributions sometimes attribute propositional knowledge and sometimes attribute something different, such as a relation to an activity.

We can describe the situation as follows: English has a compositional semantics for questions, giving meaning to a variety of expressions in the knowledge-wh camp including knowledge-how. However, in certain times knowledge-how attributions don't do what the compositional semantics predicts, but rather express something else. Are there other examples of such cases? For one, there are idioms, like *kicked the bucket*. Could knowledge-how have an idiomatic use in addition to its non-idiomatic use? Certain (un-MIT) approaches to semantics try to generalize beyond idioms to a range of special meanings associated with particular constructions. For instance, Goldberg's [1995] construction grammar. For an instance of an idiom more flexible than *kicked the bucket* take *Why don't you . . . ?* and *. . . never got around to . . .* Not sure what to make of this view.

Related view: suppose there is this *sui generis* mental state of knowing how. How do we refer to it? Two strategies: a) languages develop a specific construction/expression for it as in Romance languages/Chinese/Russian (and English with respect to *learn*), b) use an expression with a related/close compositional meaning to pick it out: in this case the knowledge-how construction in English, and then that use (which may have metaphorical/approximate) meanings becomes regularly associated with it. (As another extended use, regularly associated with something: "John ate up those lectures", which is essentially metaphorical.)

I'm not giving a theory here. I'm rather suggesting that in absence of a solid account idiomatic constructions, extended uses (such as metaphorical ones) we lack a good case from the compositional semantics of questions attributions to the claim that all the mental states we regularly refer to using knowledge-how constructions in English are states of propositional knowledge.

Or a compromise: as Glick [2011] suggests loosen up about attributions of propositional knowledge (à la S&W, who are very loose indeed), but maintain that there are important distinctions between know-how and other kinds of propositional knowledge. So essentially accept INTELLECTUALISM insofar as treating know-how as propositional, but emphasize other dis-

tinctions. He emphasizes that propositional knowledge comes in different flavors. For example, animals/children might be said to know about inertia without having conceptual resources to state what they know. Still what is impressive about know-how might not be that it comes easily (i.e. without conceptual resources, being able to state the proposition known), but that it is *hard* as well, which is less easily explicable by appeals to looseness of propositional attitude attributions.

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