Knowing the Answer

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> *"ev'ry gambler knows that the secret to survivin' is knowin'*
> *what to throw away and knowing what to keep."*
> (Kenny Rogers)

How should one understand knowledge-*wh* ascriptions? That is, how should one understand claims such as "I know where the car is parked," which feature an interrogative complement? The received view is that knowledge-*wh* reduces to knowledge that *p*, where *p* happens to be the answer to the question *Q* denoted by the *wh*-clause. I will argue that knowledge-*wh* includes the question—to know-*wh* is to know that *p*, *as the answer to Q*. I will then argue that knowledge-*that* includes a contextually implicit question. I will conclude that *knowledge is a question-relative state*. Knowing is knowing the answer, and whether one knows the answer depends (in part) on the question.

1. The Reductive View of Knowledge-*wh*

How should one understand knowledge-*wh* ascriptions? By a knowledge-*wh* ascription, I mean an ascription of knowledge which features an interrogative complement.[1] So knowledge-*wh* ascriptions include ascriptions of knowledge-*who*, *what*, *when*, *where*, *how*, and *why*. Thus this includes the following examples: "Ann knows who the speaker is," "Ann knows what he'll be talking about," "Ann knows when he is scheduled to start," "Ann knows where the talk is being held," "Ann knows how the speaker will begin," and "Ann knows why his argument is flawed."

From the above examples, it should be clear that knowledge-*wh* ascriptions are ubiquitous. Also consider: "I know what time it is," "I know where the movie is playing," and "I know who is coming to dinner," as well as Maya Angelou's: "I know why the caged bird sings,"

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[1] Terminology: I use "interrogative" and "*wh*-clause" interchangeably, to denote bits of the language (such as "where the car is parked"). I use "question" to denote the abstracta that these bits denote (which I assume to be partitions on logical space: §2). The terminology is parallel to the terminology of "declarative" and "*that*-clause," as bits of the language (e.g. "that the car is parked on Main"), and "proposition" as the abstracta that those bits denote (which I assume to be regions of logical space).

and Kenny Rogers's: "You got to know when to hold 'em, know when to fold 'em, know when to walk away and know when to run." These examples might lead one to suspect that knowledge-*wh* ascriptions are more common than knowledge-*that* ascriptions. Such is confirmed by that great tool of empirical linguistics, the Google search engine, which yields about *four times* as many hits for the knowledge-*wh* forms as for knowledge-*that* (58.6 million to 14.5 million).[2]

Yet epistemologists have had little to say about knowledge-*wh*. Perhaps this is because we have focused on a handful of skeptical arguments, in which knowledge-*that* claims feature. Or perhaps we still deploy Ryle's (1949) distinction between knowledge-*that* and knowledge-*how*, which leaves no place for knowing *who*, *what*, *when*, and the rest. Or perhaps, as Jonathan Vogel suggested to me, knowledge-*that* has just proven so hard, that we've gotten stuck.

In any case, those few epistemologists who have explicitly discussed knowledge-*wh*—including Hintikka (1975), Lewis (1982), Boër and Lycan (1986), Higginbotham (1996), and Stanley and Williamson (2001)—have all maintained that knowledge-*wh* reduces to knowing that *p*. That is, these epistemologists have all maintained that knowledge-*wh* ascriptions should be analyzed via K*sp* relations, in which the question *Q* goes missing. To the extent that there is a received view, this is it.

Why think that knowledge-*wh* reduces to K*sp*? The reductive view seems to be motivated by two main assumptions, the first of which is that knowledge-*that* is the model. That is, it is supposed that knowledge ascriptions of the surface form "*s* knows that *p*" are normal and basic. This consigns knowledge-*wh* to the status of the deviant and derivative. Thus Hintikka classifies various epistemic constructions as departures from the knowledge-*that* form (1975, p. 2), Williamson claims that a factive mental state operator like "know": "*typically* takes… as object a term consisting of 'that' followed by a sentence." (2000, p. 34, italics added) Stanley and Williamson contrast "question-embedding uses of 'know' and *normal* clausal-complement uses of 'know'," (2001: 421, italics added), and Higginbotham writes:

> ["Knows"] may take for its complement ordinary nominals referring to propositions, and finite clauses, which do the same; and it is natural to suppose that its use as in ["Mary knows whether it was raining"] is *derivative* from this. (1996: 379, italics added)

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2 Google research has its perils. For instance, the knowledge-*that* count missed cases of "that" deletion ("I know [that] I have hands"), and miscounted cases with demonstrative "that" ("I know that man.") Further, the knowledge-*wh* count missed cases of concealed questions ("I know [what is] the answer"). Still, the results are suggestive. At minimum they confirm the ubiquity of the knowledge-*wh* forms.

The second main assumption motivating the reductive view is the assumption that knowledge-*that* expresses K*sp*. That is, it is supposed that "*s* knows that *p*" wears its logical form on its surface, expressing a binary relation between a subject *s* and a proposition *p*—it is supposed that one can just *see* the K*sp* syntax here.[3] Such a form leaves no place for a question. Thus Hintikka attempts to press all epistemic constructions into constructions with K*sp*, Lewis analyzes knowledge-*whether* via K*sp*, Boër and Lycan analyze knowledge-*who* via K*sp*, and Stanley and Williamson analyze knowledge-*how* via K*sp*. Indeed, the assumption that the knowledge relation has the form K*sp* is built into the classic justified-true-belief analysis (Chisholm, 1977; Gettier, 1963), and virtually all of its post-Gettier descendants.

Perhaps knowledge is assumed to have the form K*sp*, from the surface of "*s* knows that *p*." Or perhaps "*s* knows that *p*" is assumed to be the norm, in the image of K*sp*. I think these assumptions are just two sides of a common coin (the linguistic and epistemic faces of the coin of the realm). Pressing them together:

1. Knowledge-*that* is the model: the basic knowledge ascription has the surface form "*s* knows that *p*."

2. Knowledge-*that* expresses K*sp*: the surface form "*s* knows that *p*" expresses the logical form K*sp*.

Knowledge-*wh* is thought to reduce to K*sp*, then, because knowledge-*wh* is modeled after knowledge-*that*, which looks to express K*sp*.

How, then, is knowledge-*wh* supposed to reduce to K*sp*? Those epistemologists who have upheld the reductive view have offered much the same answer: to know-*wh* is to know that *p*, where *p* happens to be the answer to the question *Q* denoted by the *wh*-clause.[4] Higginbotham

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[3] Though it is pure naïveté to think that one can just see the syntax directly. As Ludlow (2005, p. 22) notes, linguists have long appreciated that syntax is not 'in view'.

[4] By "the answer" I mean the true answer (the proposition including actuality). When I need to mention other potential answers to a given question, I will explicitly mark these as false or merely possible answers. Strictly speaking the phrase "the answer" is only apt for *exclusive questions*, which have a unique true answer. Some questions such as "what is an example of a prime number less than 2?" have *false presuppositions*, and thus no true answer. Thus one cannot know what is an example of a prime number less than 2. Other questions such as "what is an example of a prime number less than 100?" are *non-exclusive*, permitting many true answers. One can know what is an example of a prime number less than 100 by knowing *an* answer. I will continue to speak of "knowing the answer" in the main text for colloquial purposes, but "knowing *an* answer" is more accurate in general. Nothing of substance will turn on this.

states this explicitly, as the rule: "know$(x, \hat{\,} \pi) \leftrightarrow (\exists p)$ (know(x,p) & p answers π)" (1996, p. 381).[5] So, for instance, to know what time it is, when it is 6pm, is to know that the time is 6pm. To know who the speaker is, when it is Schaffer, is to know that Schaffer is the speaker. To know where the car is parked, when it is on Main, is to know that the car is parked on Main. Thus the reductive view concludes:

3. Knowledge-*wh* reduces to K*sp*: *s* knows-*wh* iff K*sp*, where *p* is the true answer to the indirect question *Q* of the *wh*-clause.

And so, on the reductive view, to know-*wh* is to know that *p*. To know-*wh* is to know the proposition that just so happens to be the answer.[6]

The reductive view deserves praise. It is intuitively plausible, and theoretically elegant in unifying knowledge-*wh* and knowledge-*that*. No wonder it is the received view.

2. The Problem of Convergent Knowledge

The reductive view of knowledge-*wh* faces a problem. Call questions with the same true answer *convergent questions*. And call knowledge-*wh* claims that embed convergent questions *convergent knowledge claims*. The problem is that the reductive view entails that all convergent knowledge claims are equivalent.

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5   Instances of this rule are implicit in Hintikka's treatment of "knows who," Lewis's treatment of "knows whether," and Stanley and Williamson's treatment of "knows how." Thus for Hintikka, "*a* knows who *b* is" is analyzed as: $(\exists x)$ *a* knows that $(b = x)$ (1975, p. 4). For Lewis, "Holmes knows whether … if and only if he knows the true one of the alternatives presented by the 'whether'-clause, whichever one that is." (1982, p. 45) And for Stanley and Williamson, "Hannah knows how to ride a bicycle" is "true if and only if, for some contextually relevant way *w* which is a way for Hannah to ride a bicycle, Hannah knows that *w* is a way for her to ride a bicycle." From which they conclude: "Thus, to say that someone knows how to *F* is always to ascribe them knowledge-that." (2001, p. 426)

6   It is worth distinguishing three different grades that the reductive view may come in. On the strongest form, knowledge-*wh* ascriptions express proposition of the form K*sp*. Here there is no question at all in the logical form—the interrogative is somehow managing to denote a proposition. On the intermediate form of the reductive view, knowledge-*wh* ascriptions express existentially quantified propositions embedding K*sp*, of the form $(\exists p)$ (K*sp* & *p* is the answer to *Q*). Here there is a question in the logical form, but it is not included inside the knowledge relation. On the weakest form of the reductive view, knowledge-*wh* ascriptions express propositions of the form K*sQ*, but the truth-conditions for such propositions are given by the rule: K*sQ* iff $(\exists p)$ (K*sp* & *p* is the answer to *Q*). Here there is a question inside the knowledge relation (though now there is no proposition!), but it is materially equivalent to a K*sp* relation. The problem of convergent knowledge (§2) will apply to the reductive view in all its forms.

To illustrate, suppose that George W. Bush is speaking on television. Then the questions "Is Bush or Janet Jackson on television?" and "Is Bush or Will Ferrell on television?"[7] are convergent—they have the same true answer, namely "Bush is on television":

Q_1: Is Bush or Janet Jackson on television?
Q_2: Is Bush or Will Ferrell on television? $\left.\right\}$ p_1: Bush is on television.

So the following knowledge claims are convergent:

KQ_1: I know whether Bush or Janet Jackson is on television.
KQ_2: I know whether Bush or Will Ferrell is on television.

Ksp_1: I know that Bush is on television.

So on the reductive view, KQ_1 and KQ_2 turn out equivalent, since each is equivalent to Ksp_1.[8]

In general, if wh_1 and wh_2 have the same true answer p, then the reductive view entails that s knows-wh_1 iff s knows-wh_2 (since s knows-wh_1 iff Ksp, and s knows-wh_2 iff Ksp). Thus:

4. 3 entails that all convergent knowledge claims are equivalent: the reductive view entails that, if wh_1 and wh_2 have the same true answer, then s knows-wh_1 iff s knows-wh_2.

Yet 4 seems false. KQ_1 and KQ_2, for instance, are clearly inequivalent. Knowing whether Bush or Janet Jackson is on television is a relatively *easy* task. The question of whether it is Bush or Janet Jackson is a relatively easy question. Virtually anyone (with decent vision and minimal cultural background) can know whether it is Bush or Janet Jackson. In contrast, knowing whether Bush or Will Ferrell is on television is a relatively *hard* task. If the impersonation is good enough, the question of whether it is Bush or Will Ferrell may be a rather hard question. Perhaps only first lady Laura Bush will be able to tell the difference. So one might well know whether Bush or Janet Jackson is on television, but fail to know whether Bush or Will Ferrell is on television.

As a second illustration, suppose that there is a goldfinch in the garden. Then the questions "Is there a goldfinch in the garden, or a

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7   Background information: Janet Jackson is a pop diva who would be hard to confuse with Bush. Will Ferrell is a comedian who is a tolerable Bush impersonator. (Daniel Nolan has suggested I add: George W. Bush is the current president of the United States—a large country in North America.)

8   On the strongest form of reductionism (as per note 6), KQ_1 and KQ_2 turn out to express the same proposition. On the intermediate and weakest form, they turn out to express different but materially equivalent propositions.

raven?" "Is there a goldfinch in the garden, or a canary?" and "Is there a goldfinch in the garden, or at the neighbor's?" are convergent—they have the same true answer, namely "There is a goldfinch in the garden":

Q_3: Is there a goldfinch in the garden, or a raven?
Q_4: Is there a goldfinch in the garden, or a canary? p_2: There is a goldfinch
Q_5: Is there a goldfinch in the garden, or at the neighbor's?   in the garden.

So the following knowledge claims are convergent:

KQ_3: I know whether there is a goldfinch in the garden, or a raven.
KQ_4: I know whether there is a goldfinch in the garden, or a canary.
KQ_5: I know whether there is a goldfinch in the garden, or at the neighbor's.

Ksp_2: I know that there is a goldfinch in the garden.

So on the reductive view, KQ_3-KQ_5 all turn out equivalent, since each is equivalent to Ksp_2.

Yet KQ_3, KQ_4, and KQ_5 are clearly inequivalent. Knowing whether there is a goldfinch in the garden or a raven is a relatively *easy* task of *bird-identification*. Virtually anyone (with decent vision and minimal expertise) can know whether there is a goldfinch in the garden or a raven. In contrast, knowing whether there is a goldfinch in the garden or a canary is a *harder* task of bird-identification. Perhaps only an expert birder will be able to tell the difference. And knowing whether there is a goldfinch in the garden or at the neighbor's is an *incommensurate* task, one concerning *landscape* instead of birds. Perhaps only the homeowner will be able to answer this question. So one might well know whether there is a goldfinch in the garden or a raven, but fail to know whether there is a goldfinch in the garden or a canary, and/or fail to know whether there is a goldfinch in the garden, or at the neighbor's.

Now KQ_1-KQ_5 all involve knowledge-*whether*. But there is nothing special about *whether*-phrases. All *wh*-phrases denote sets of alternatives—their possible answers.[9] All questions are multiple-choice questions. The only difference is that some *whether*-phrases list their answers explicitly, while other *wh*-phrases generate answers via a matrix over a contextually determined domain. So the question "Who is on television?" when asked in a context where the relevant alternatives are Bush and Jackson, generates the alternatives: {Bush is on television, Jackson is on television}. Thus KQ_1 is equivalent to "I know who is on television" uttered in a context where the relevant alternatives are Bush and Jackson. KQ_2 is equivalent to "I know who is on television"

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[9]   The view of questions as denoting sets of alternatives is due to Hamblin (1958). It is implemented in Belnap and Steel's (1976) erotetic logic, and maintained in the leading linguistic treatments of interrogatives, including the partition semantics of Groenendijk and Stokhof (1997).

uttered in a context where the relevant alternatives are Bush and Fer-rell.[10] The knowledge-*whether* constructions I am using are just explicit ways to make a general point.

In general, if a question has a true answer, it must converge with any question that merely shifts the false answers. So supposing that ϕ, the question: ?: $(\phi \vee \varphi)$, must converge with the question: ?: $(\phi \vee \rho)$. So given the reductive view, the following schema must be valid:

$$\begin{array}{l} S \text{ knows } ?: \phi \vee \varphi \\ \underline{\phi \qquad\qquad\qquad} \\ \text{X} \quad S \text{ knows } ?: \phi \vee \rho \end{array}$$

But this schema is clearly *invalid*. Sometimes shifting the false answers, or adding devious ones, can turn an easy question into a hard question. Anyone who has devised a multiple-choice exam will recognize this. A student might well know the answer only when the options are easy. Thus:

> 5. Not all convergent knowledge claims are equivalent: it is not the case that, if wh_1 and wh_2 have the same true answer, then s knows-wh_1 iff s knows-wh_2.

Thus the reductive view of knowledge-*wh* is false. There is more to knowledge-*wh* then knowing the proposition that just so happens to be the answer.

3. Replies Considered

I can conceive of three main ways for the defender of the reductive view of knowledge-*wh* (§1) to reply to the problem of convergent knowledge (§2). She might (i) *deny the intuitions* of inequivalence; (ii) accept the intuitions of inequivalence, but deny that they are *semanti-cally generated*; or (iii) accept the intuitions of inequivalence as seman-tically generated, but still uphold the reductive view as *best overall*. I will address these replies in turn.

So first, can one deny the intuitions of inequivalence? Here are three arguments against denial. First, the intuitions seem *clear*. Look again at KQ_3-KQ_5. These are simple and ordinary constructions. This is not the sort of case where our performance capacities are in question, or

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10 Likewise, KQ_3 is equivalent to "I know what bird is in the garden" uttered in a context where the relevant alternatives are goldfinch and raven. KQ_4 is equivalent to "I know what bird is in the garden" uttered in a context where the relevant alternatives are goldfinch and canary. And KQ_5 is equivalent to "I know where the goldfinch is" uttered in a context where the relevant alternatives are the garden and the neighbor's.

where we are thrown by a strange mode of speech. At least by my lights, the judgments here do not seem too difficult.[11]

The second argument against denial is that even clearer intuitions arise with *kindred verbs*. Intuitions about "knows" are subject to theoretical noise. So it might help to consider verbs lexically kindred to "knows"—other factive verbs that permit either interrogative (*wh-*) or declarative (*that-*) complements, such as "forgets" and "regrets." Convergent forgetting and regretting ascriptions are clearly inequivalent. Suppose that I in fact left my keys on the table, but can't remember whether I left my keys on the table or by the phone. Though I at least remember that I did not leave my keys in the fridge. Then the following questions are convergent:

Q_6: Did I leave my keys on the table, or by the phone? $\left.\right\}$ p_3: I left my keys on
Q_7: Did I leave my keys on the table, or in the fridge? the table.

So the following forgetting claims are convergent:

FQ_6: I forgot whether I left my keys on the table, or by the phone.
FQ_7: I forgot whether I left my keys on the table, or in the fridge.

Fsp_3: I forgot that I left my keys on the table.

Yet FQ_6 and FQ_7 are clearly not equivalent. Indeed, as the story is told, FQ_6 is true and FQ_7 false.

Or consider the claim "I regret who is president," said in a context in which the domain of candidates is {Bush, Kerry}, and the same words said in a context in which the domain of candidates is {Bush, Cheney}. Here the question of "Who is president?" is a convergent question:

Q_8: Who is president: Bush or Kerry? $\left.\right\}$ p_4: Bush is president.
Q_9: Who is president: Bush or Cheney?

So the following regret claims are convergent:

RQ_8: I regret who is president [as between Bush and Kerry].
RQ_9: I regret who is president [as between Bush and Cheney].

Rsp_4: I regret that Bush is president.

Yet it should be obvious that RQ_8 and RQ_9 are inequivalent. Indeed, for a speaker who prefers Kerry, and finds Bush and Cheney equally repugnant, RQ_8 will be true and RQ_9 false. Thus a pattern emerges with forget-*wh* and regret-*wh*. We should expect knowledge-*wh* to fit the pattern.

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[11] Indeed, virtually everyone I have asked has shared the intuitions of inequivalence—this includes my naïve undergraduates, as well as sophisticated epistemologists with a predilection for reductionism. Though I have not run proper surveys (yet!), the intuitions here seem widespread and robust.

The third argument against denial is that inequivalence is supported by the *conceptual role* of knowledge ascriptions. Knowledge ascriptions serve such roles as indicating who has evidence, identifying experts, and fingering who can answer the question at hand.[12] Convergent knowledge claims such as KQ_3-KQ_5 require different evidence, identify different experts, and finger different answerers. KQ_3 requires evidence of plumage, and fingers virtually anyone as expert and answerer. KQ_4 requires evidence of wing coloration, and fingers the ornithologist as expert and answerer. In contrast, KQ_5 requires evidence of landscape, and fingers the homeowner as expert and answerer. To deny the intuitions of inequivalence is thus to deny knowledge ascriptions their natural conceptual role.

So second, can one accept the intuitions of inequivalence, but deny that they are semantically generated? Here are two arguments against going pragmatic. First, it is unclear what *known pragmatic mechanism* could generate such intuitions. The burden is on the defender of the reductive view to provide the details (without inventing 'new pragmatic rules').

Perhaps the most plausible way to go pragmatic here is to invoke Grice's *maxim of relevance*, and say that the different alternatives mentioned in the convergent knowledge-*wh* claims generate different implicatures concerning which possibilities one needs evidence against.[13] So for instance, one might hold that KQ_2 merely implicates that one needs evidence against Will Ferrell being on television, where this is not semantically entailed. But there are two main problems with this strategy. First, the alleged implicature fails the most telling test for implicature, in that it is *non-cancelable*. Thus it seems absurd to say: "I know whether Bush or Ferrell is on television, and I have no evidence against the possibility that Ferrell is on television." Further, this alleged implicature could only explain why one might withhold from asserting KQ_2. But it seems, intuitively, that we would go so far as to *assert the denial* of KQ_2. So even the most plausible way of going pragmatic does not work.

The second argument against going pragmatic returns to the conceptual role of knowledge ascriptions. Since knowledge ascriptions serve the

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[12]   The idea that knowledge ascriptions indicate who has evidence is due to Wittgenstein, who says that knowledge ascriptions serve to indicate when "one is ready to give compelling grounds." (1969, §243; also §50, §483-5) The idea that knowledge ascriptions identify experts is due to Craig, who says that the role of the knowledge ascription is "to flag approved sources of information." (1990, p. 11) And the idea that knowledge ascriptions finger answerers is due to Hookway: "The central focus of epistemic evaluation is…the activity of inquiry… When we conduct an inquiry,… we attempt to formulate questions and to answer them correctly." (1996, p. 7). See Schaffer, 2006 (§1) for further discussion.

[13]   Rysiew, 2001 suggests a partially related pragmatic explanation for the pull of skeptical arguments.

roles of indicating who has evidence, expertise, and answers, going prag-
matic here entails holding that the semantic meaning of "knows" cannot
support its conceptual roles. Meaning and use would disconnect.

Third and finally, can one accept the intuitions of inequivalence as
semantically generated, but still champion the reductive view as best
overall? Can one just bite the bullet? Well, given the link between the
inequivalence of convergent knowledge and the conceptual role of
knowledge, to bite the bullet here is to unsuit knowledge ascriptions
for their roles of indicating who has evidence, identifying experts, and
fingering answerers. The resulting relation would hardly deserve the
title of 'knowledge.' Perhaps there is a better view?

4. The Question-including View of Knowledge-*wh*

The problem of convergent knowledge has a natural solution. The solu-
tion is to include the question Q (which is sitting right on the surface
of the knowledge-*wh* ascription). More precisely, the solution is to
replace 3 with the following:

  6. Knowledge-*wh* includes the question: s knows-*wh* iff $KspQ$,
     where Q is the indirect question of the *wh*-clause, and p its true
     answer.

Here the knowledge relation is relativized to the question: $KspQ$ rather
than Ksp. $KspQ$ may be read as: s knows that p, as the true answer to
Q. It is not enough to know that p—one must know p as the true
answer. In other words, it is not enough to know the proposition that
just so happens to be the answer—one must know the answer *as such*.

(6 is, in essence, a contrastive account of knowledge-*wh*.[14] Given that
Q denotes a set of alternatives (§2), the question-relative relation $KspQ$

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[14] The contrastive theory emerges in the following passage from Dretske: "To know
that x is A is to know that x is A within a framework of relevant alternatives, B, C,
and D. This set of contrasts…serve to define what it is that is known…" (1970: 1022)
Versions of the theory have since been defended by Johnsen (2001), Morton and
Karjalainen (2003), Sinnot-Armstrong (2004), Schaffer (2004, 2005, 2006), and Bla-
auw (2004).

Recently, Harman and Sherman (2004) have proposed an assumption-prefixing
view of knowledge, on which all knowledge claims are relativized to assumptions out-
side of the knowledge relation (with the form: Assuming a, Ksp). The assumption-
prefixing view should be compared to the assumption-including view, in which the
assumption is inside the knowledge relation (with the form: $Kspa$). The assumption-
including view is contrastivism by another name. The $Kspa$ state is equivalent to the
contrastive state $Kspq$, where $a = pvq$. It is unclear to me what work assumption-pre-
fixing is doing for Harman and Sherman that assumption-inclusion would not do
(both can equally be used to challenge or reformulate closure principles). So I should
say that 6 is equivalent to the assumption-including view, and may well be similar in
spirit to the assumption-prefixing view.

is equivalent to the contrast-relative relation Kspq where q is the disjunction of non-p answers to Q. For instance, (i) knowing that there is a goldfinch in the garden, as the true answer to whether there is a goldfinch in the garden or a raven, is equivalent to (ii) knowing that there is a goldfinch in the garden rather than a raven.[15])

Here are three arguments for 6. First, 6 solves the problem of convergent questions. In the case where Bush is on television, KQ_1 and KQ_2 come out as expressing different propositions: KspQ_1 and KspQ_2. To know whether Bush or Janet Jackson is on television is to know that *Bush is on television*, as the true answer to the question of *whether Bush or Janet Jackson is on television*. While to know whether Bush or Will Ferrell is on television is to know that *Bush is on television*, as the true answer to the question of *whether Bush or Will Ferrell is on television*. Likewise, in the case of the goldfinch in the garden, KQ_3, KQ_4, and KQ_5 come out as expressing different propositions: KspQ_3, KspQ_4, and KspQ_5. It is the inclusion of the question that differentiates the knowledge propositions.[16,17]

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[15]   Qualification: in cases where the question has three or more possible answers, KspQ contains more structure than Kspq—KspQ includes a partition of the contrast space, while Kspq has one big unstructured contrast. To illustrate, suppose that Sam is five feet tall, and consider the questions:

   Q_{10}: Is Sam less than six feet tall, between six and seven feet tall, or greater than seven feet tall?
   Q_{11}: Is Sam less than six feet tall, between six feet and six-and-a-half feet tall, between six-and-a-half and six-and-three-quarters feet tall, or greater than six-and-three-quarters feet tall?

   These are inequivalent questions: Q_{10} denotes a set of three alternatives, while Q_{11} denotes a set of four alternatives. So the KspQ_{10} and KspQ_{11} states are distinct. But both collapse into the same contrastive state Kspq, where q is the proposition that Sam is greater-than-or-equal-to six feet tall. Though this seems unproblematic—the additional partitional structure is epistemically inert. To know one must eliminate all the relevant alternatives, however these are partitioned.

[16]   One might object that the problematic entailments may be regained via *closure*. That is, one might object that, while 6 indeed provides different items of knowledge, these different items still entail each other via some form of closure inference. The objection may be put like this: if I do indeed know that *Bush is on television*, as the true answer to the question of *whether Bush or Janet Jackson is on television*, can't I use this bit of knowledge to deduce that *Bush is on television*, as the true answer to the question of *whether Bush or Will Ferrell is on television*? My answer is *no*, though this turns on how to understand closure inferences for the question-relativized KspQ. See Schaffer, 2007 for a detailed exploration of contrastive closure principles, based on the idea of extending answers to questions. The inference from KspQ_1 to KspQ_2 is an instance of the generally *in*valid Replace-q rule.

[17]   The solution extends to the parallel problem of convergent forget-*wh* and regret-*wh* ascriptions. For instance, RQ_8 and RQ_9 come out as expressing different propositions: Rsp_4Q_8 and Rsp_4Q_9.

Second, 6, fits the role of knowledge ascriptions in indicating who has evidence, expertise, and answers (§3). For who has evidence, expertise, and answers is a function of the question. For instance, if the question is Q_3, then the person with the evidence, expertise, and answer is the person who can tell a goldfinch from a raven. If the question if Q_4, then the person with the evidence, expertise, and answer is the person who can tell a goldfinch from a canary. And if the question if Q_5, then the person with the evidence, expertise, and answer is the person who can tell the garden from the neighbor's. The inclusion of the question fits the conceptual role of knowledge ascriptions, because *all these roles are question-relative roles*.

Third, there is direct linguistic evidence supporting the inclusion of the question. One piece of evidence is the validity of *existential generalization* on the question. Here is the valid existential generalization schema:

> <u>S knows-*wh*</u>
> There is a question that *s* knows the answer to

For instance, if I know where the car is parked, then it follows that there is a question that I know the answer to (namely, the question of where the car is parked). Likewise, if I know what time it is, then it follows that there is a question that I know the answer to (namely, the question of what time it is). The validity of existential generalization thus points to the presence of the question in logical form, as what is being generalized on.[18]

A second piece of evidence for the inclusion of the question is the validity of *substitution* for the question. Here is the valid substitution schema:

> S knows-*wh*
> <u>*Wh* is an ADJ question</u>
> S knows the answer to an ADJ question

For instance, if I know when Napoleon was born, and if when Napoleon was born is a historical question, then it follows that I know the answer to a historical question. The validity of substitution thus points to the presence of the question in logical form, as what is being substituted for.

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[18] To see the force of existential generalization, one should contrast the valid inference schema in the main text with an existential generalization schema on a non-question-including relation like believing. Here existential generalization fails:

> <u>S believes that *p*</u>
> X There is a question that *s* believes the answer to

A third piece of evidence for the inclusion of the question comes from the availability of *anaphoric reference* to the question. Thus consider: "I know why the sky is blue. It is a tricky question." Or try: "I now know why the sky is blue. I had wondered about it for years." In both cases, a natural reading of "it" is as referring to the question of why the sky is blue. The availability of this reading points to the presence of the question in logical form, as what the anaphor is bound to.[19]

In summary, the inclusion of the surface question Q in the proposition expressed by knowledge-*wh* ascriptions is supported by (i) the inequivalence of convergent knowledge claims, (ii) the question-relativity of the role of knowledge ascriptions, and (iii) the question-including results of the linguistic diagnostics. Knowledge-*wh* ascriptions do not express K*sp*. They express K*spQ*. To know-*wh* is to know the answer, and whether one knows the answer depends (in part) on the question.[20]

5. Consequences for Knowledge-*that*

The reductive view of knowledge-*wh* had unified knowledge-*wh* and knowledge-*that*. But if knowledge-*wh* includes the question Q, is unity lost? In general, what is the relation between knowledge-*wh* and knowledge-*that*?

Intuitively, knowledge-*wh* and knowledge-*that* seem to express one and the same relation. For instance, there seems to be *univocity*

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[19]   All three of the above linguistic tests are defeasible heuristics. What is compelling here is the fact that they all line up the same way.

[20]   There is equally direct linguistic evidence supporting the inclusion of the proposition p in logical form (which rules out the weakest form of the reductive view, as per note 6). Here is existential generalization on the proposition:

> *S* knows-*wh*
> There is an answer that *s* knows to the question of *wh*

For instance, if I know where the car is parked, then it follows that there is an answer that I know to the question of where the car is parked. Here is substitution for the proposition:

> *S* knows-*wh*
> The answer to *wh* is an ADJ answer
> *S* knows the ADJ answer to the question of *wh*

For instance, if I know why the caged bird sings, and if the answer to why the caged bird sings is a tragic answer, then I know the tragic answer to the question of why the caged bird sings. And finally, here is anaphoric reference to the proposition: "I know why the sky is blue. I learned it in class this morning." Here a natural reading of "it" is as referring to the proposition that answers the question.

among the occurrences of "knows" in, for instance, "Moore knows that he has hands" and "Moore knows whether he has hands." Indeed, three further arguments can be mustered for univocity. First, there is an entire lexical class of factive verbs that permit either interrogative (*wh*-) or declarative (*that*-) complements, including "knows," "forgets," and "regrets," as well as "discovers," "cares," "guesses," and "learns," *inter alia*. Ambiguities are one-off lexical accidents. The cross-lexical evidence is too systematic for ambiguity. The second further argument for univocity is that other languages univocally translate these occurrences of "knows." Even languages that mark an ambiguity in knowledge (including French: "savoir" and "connaître," and German: "wissen" and "kennen") translate knowledge-*that* and knowledge-*wh* univocally. Since ambiguities are one-off lexical accidents, the cross-linguistic evidence is too systematic for ambiguity. Finally, there are direct tests for univocity, such as *coordination across conjunction*. Thus consider: "John knows that Peter has left for Paris, and whether Mary has gone with him," and "I know what time it is, and that I promised to cook dinner." These strings feature a single occurrence of "know," one and the same lexical item, hooking onto both an interrogative and a declarative complement. Thus:

7. "Knows" is univocal in knowledge-*wh* and knowledge-*that*: there is no ambiguity between occurrences of "knows" with interrogative and with declarative complements.[21]

But then if knowledge-*that* expresses Ksp, as per 2, knowledge-*wh* would have to express Ksp, as per 3. If knowledge-*that* expresses Ksp, and knowledge-*wh* expresses KspQ, then "knows" would be ambiguous after all, between relations of different adicities. To reverse the point: if knowledge-*wh* expresses KspQ, as per 5, then knowledge-*that* must also

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[21] Corollary: the arguments that "knows" is univocal between knowledge-*that* and knowledge-*wh* constructions show that there is no ambiguity between knowledge-*that* and knowledge-*how* (*contra* Ryle, 1949; but as per Groenendijk and Stokhof, 1997; and Stanley and Williamson, 2001). Further, consider: (i) "Moore knows that Russell thinks," (ii) "Moore knows what Russell thinks," and (iii) "Moore knows how Russell thinks." Those who follow Ryle will, presumably, regard "knows" as ambiguous across (i) and (iii). But "knows" does not seem ambiguous between (i) and (ii), or between (ii) and (iii). Those who follow Ryle usually say that knowledge-*how* involves some sort of practical (non-intellectual) ability. But consider: "Biologists know how turtles reproduce," as well as Monty Python's explanation of how to play the flute: "Well, you blow in one end and move your fingers up and down the outside."

express K*spQ* on pain of ambiguity. In short, 6 and 7 entail that 2 should be replaced by the following:

> 8. Knowledge-*that* includes a question: Knowledge-*that* claims express the same relation as knowledge-*wh* claims, and since the latter express K*spQ*, so must the former.

Indeed, all the arguments for knowledge-*wh* including a question (§4) extend to knowledge-*that*. Consider the claim "I know that there is a goldfinch in the garden," in answer to the questions Q_3-Q_5. Here the same intuitions of inequivalence arise. If the speaker can tell a goldfinch from a raven but not from a canary, the claim will seem true in answer to Q_3, false in answer to Q_4.[22] Further, the role of knowledge ascriptions in indicating who has evidence, expertise, and answers remains question-relative (§4). And finally, existential generalization, substitution, and anaphoric reference will work on the question. So if I know that Napoleon was born in 1769, then (i) there is a question that I know the answer to (*existential generalization*), (ii) I know the answer to a historical question (*substitution*), and (iii) consider: "I know that Napoleon was born in 1769. It is an easy question." Here a natural reading of "it" is as referring to the implicit question of when Napoleon was born (*anaphoric reference*).

As further evidence for 8, consider constructions like "know beyond a reasonable doubt that..." and "know beyond a shadow of a doubt that..."—if doubts are understood in terms of questions, then such constructions are directly reporting knowledge states relative to different ranges of questions. So if one cannot rule out a fairly unrealistic alternative, one might know beyond a

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[22] Hawthorne has suggested that the question-sensitivity of our intuitions here may be explained away, on grounds that "the very asking of a question may provide one with new evidence regarding the subject matter..." (2004, p. 78) The idea is that (i) the subject fields the question, and (ii) the subject then uses the question to infer that other possibilities have already been eliminated. But the subject need not field the question. We may make knowledge ascriptions of subjects who are miles away. (This situation often arises when we are considering who to email our questions to. Here we will try to assess who knows the answer *prior* to emailing them.) Also, the subject need not use the question. We may make knowledge ascriptions of subjects who have no faith in our questions at all, and who simply play along. (Anyone who has questioned students will recognize this situation.)

reasonable doubt that p, but not know beyond a shadow of a doubt that p.[23] Thus one can argue directly for 8, even independently of 6 and 7.

Putting 6 and 8 together yields my main thesis:

9. Knowledge is question-relative: The knowledge relation has the form KspQ.[24]

With 9 we regain the unified view of knowledge that reductionism promised. All knowledge is question-relative. Nothing is lost.

What may be especially plausible about 9 is how it connects knowledge to *inquiry*. Inquiry is the engine of knowledge, and it is driven by a question-and-answer process.[25] Drawing on Hintikka (1981), inquiry may be modeled as a cooperative game played between Questioner and Answerer, represented by a sequence of question-and-answer pairs $<<Q_1, A_1>, <Q_2, A_2>, ..., <Q_n, A_n>>$. By treating knowledge as question-relative, one connects knowledge to the stage of inquiry. To know is to know the answer A_i to the question Q_i currently under investigation. To know is to make progress.

How, though, is knowledge-*that* supposed to include a question? Where does the question come from? The question is to be recovered from context, in the following way. As Stalnaker suggests, a context can be modeled as a set of possible worlds (*the context set*), "which include all the situations among which speakers intend to distinguish with their speech acts." (1999b, p. 99) The context set is, "the set of possible worlds recognized by the speaker to be the 'live options' relevant to the conversation." (1999a, pp. 84-5) For instance, if one is

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23   See Ludlow, 2005 for further probes into the syntax of knowledge-*that* ascriptions, involving modification by standards ("know by everyday standards that…", "know by scientific standards that…"). Ludlow concludes that "knows" passes all the usual tests for possessing a third argument place for standards. To reconcile my arguments with Ludlow's, it suffices to identify an epistemic standard with a question to be answered. So to know by scientific standards that p is to know that p, as the answer to the question science would ask about p.

    Note that "standards" sometimes gets used to denote things like distance in logical space through which one must track truth (DeRose, 1995; this is how I stipulatively use "standards" in Schaffer, 2005). That is fine as a stipulation. I am here suggesting that the natural meaning of "standards" is rather in terms of which question must be answered.

24   Given the above identifications of question with contrast spaces, standards, and assumptions, 9 may equally be phrased in terms of the contrastivity, standards-relativity, or assumption-relativity of knowledge.

25   This is Dewey's view of inquiry: "Inquiry and questioning, up to a certain point, are synonymous terms." (1938, p. 105) As Sintonen comments in this regard: "If there is a philosophy of a working scientist it certainly is the idea that inquiry is a search for questions and answers." (1997, p. 234)

presupposing that some bird is in the garden, then the context set might take the form: {w: a goldfinch is in the garden at w, or a raven is in the garden at w, or a canary is in the garden at w}.

Stalnakerian context sets map directly onto contrast spaces. These sets of live options disjoin the possible answers. So if the context set is {w: a goldfinch is in the garden at w, or a raven is in the garden at w, or a canary is in the garden at w}, then the contextually implicit contrast to there being a goldfinch in the garden is there being a raven or a canary.

In general, on any standard view of the dynamics of conversation, the *question under discussion* forms an element of the conversational scoreboard, impacting topic choice and the licensing of ellipsis (Ginzburg, 1996, p. 414). There is always a contextually implicit question available. It is just what we are inquiring about, in any stage of the conversation.

An intuitive way to recover the question is as the question of whether p. Thus suppose that p, and consider (i) an utterance of the form "s knows that p" in context c, and (ii) an utterance of the form "s knows whether p" in c. These utterance tokens are semantically *equivalent*. That is, the following inference schemas are valid within a fixed context:

$$\frac{S \text{ knows that } \phi}{S \text{ knows whether } \phi}$$

$$\frac{S \text{ knows whether } \phi \quad \phi}{S \text{ knows that } \phi}$$

So for instance, if Moore knows that he has hands, then Moore knows whether he has hands. Likewise if Moore knows whether he has hands, and he has hands, then Moore knows that he has hands.[26] In general, the following equivalence holds:

  10. Knows-*that* is contextually equivalent to knows-*whether*: If p, then ("s knows that p" is true in c) iff ("s knows whether p" is true in c).

Now the denotation of "whether p" in c will be a function of p and the contextually determined domain of quantification (§2). Suppose that in context c_1 the question "whether Moore has hands" denotes the set {Moore has hands, Moore has stumps}, that in c_2 it denotes the set

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26   Whereas if Moore does *not* have hands, but (still) knows whether he has hands, then what is entailed is that Moore knows that he does not have hands.

{Moore has hands, Moore has tentacles, Moore has flippers}, and that in c_3 it denotes the set {Moore has hands, Moore is a brain-in-a-vat experiencing hallucinations of hands}. The implicit question in the knowledge-*that* claim will be determined by the same function. So an utterance of "Moore knows that he has hands" in c_1 will express the proposition that Moore knows that he has hands relative to the question of whether he has hands or stumps. An utterance of these words in c_2 will express the proposition that Moore knows that he has hands relative to the question of whether he has hands or tentacles or flippers. And an utterance of these words in c_3 will express the proposition that Moore knows that he has hands relative to the question of whether he has hands or vat-images of hands. These are inequivalent (though convergent) knowledge claims.[27]

What emerges is *direct linguistic evidence for something like contextualism*. That is, given 10 and the contextual variability of the question "whether p," it follows that the truth of "s knows that p" shifts with the denotation of "whether p." Such contextual variability has the following three features. First, what shifts is the value of a covert variable (the question). This allows "knows" itself to remain *invariant* in its semantic value, always expressing the one and only K relation—all that shifts is the value of Q. Second, the value of this covert variable is fixed by a general and independently needed contextual parameter (the Stalnakerian context set; the question under discussion). This means that no special rules of relevance for knowledge ascriptions need be invented. Third, what fixes the value of this covert variable is the attributor's linguistic context (what is in question in the discussion). This means that no subject factors play a role in determining the alternatives. As I have argued elsewhere, all of this represents an improvement over standard forms of contextualism, in which the semantic value of "knows" varies according to special rules of relevance that involve both attributor and subject factors.[28]

To conclude: epistemologists have long privileged knowledge-*that* as the model, and supposed that the knowledge relation has the binary Ksp form. But there was never any argument for this. It all

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[27] Note that the contextualist claim of compatibility between ordinary knowledge claims and skeptical doubts is quite natural when expressed in knowledge-*wh*. For Moore can know whether he has hands or stumps, but cannot know whether he has hands or vat-images of hands.

[28] See Schaffer, 2004, 2006 for these arguments. For standard forms of contextualism, see Cohen, 1988; DeRose, 1995; Lewis, 1996; and Neta, 2002, *inter alia*. I leave unresolved whether the question-relative view (/contrastivism) should count as a new version of contextualism, or an alternative to it. That is a merely verbal question. The substantive matter is whether the three features identified in the main text are upheld.

proceeded from a biased sample of only knowledge-*that* ascriptions, and a naïve assumption that one can just *see* their syntax directly. Knowledge-*wh* constructions are far more common and explicit, and they do not look like K*sp* constructions—indeed, as I have argued, they are most naturally treated as question-involving K*spQ* constructions. From this perspective, knowledge-*that* constructions prove to be a misleading model, since they are inexplicit about the question. All knowledge involves a question. To know is to know the answer.[29]

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