Some Observations on the Semantic Types of Question-Embedding Verbs

INTRODUCTION The semantic type of word denotations lies at the heart of compositional semantics, whether semantic objects combine directly via shifting operations (Jacobson 1999, Barker and Jacobson 2007, *inter alia*) or in a type-driven semantic theory (e.g. Heim and Kratzer 1998 and followers) where incompatible types can force movement or uninterpretability. Consequently, the question of whether verbs that allow interrogative clauses in argument positions (such as *know* and *wonder*) have types that combine directly with question meanings has theoretical and empirical consequences—as does the question of what semantic type these question meanings are. In this paper, I offer evidence that, in contrast to the $\langle\langle st, t\rangle, et\rangle$ object denoted by *wonder*, verbs that embed both propositions and interrogatives like *know* uniformly denote $\langle st, et\rangle$ objects.

UNIFORMITY—BUT WHERE? Lahiri (2000) and Beck & Sharvit (2002) offer opposing theories on verb types, corresponding to differing interpretations of Quantificational Variability Effect (QVE) sentences, in which an adverb quantifies over a question object as in sentence **(1)**. Agreeing that interrogatives denote sets of propositions with type $\langle\langle s, t\rangle, t\rangle$ (Hamblin 1973, Karttunen 1977) and that *wonder* denotes only a function from questions to properties (type $\langle\langle st, t\rangle, et\rangle$) while *know* with a proposition denotes a function from propositions to properties (type $\langle st, et\rangle$), they diverge in their treatment in *know* with an interrogative. For Lahiri, a QVE adverb quantifies over propositions in the question and *know* uniformly denotes an $\langle st, et\rangle$ object which combines with these propositions; this derives the ungrammaticality of **(2)** from the inability of *wonder* to combine with a propositional meaning, but fails to account for **(3a)**, in which the verb cannot combine with a propositional meaning (as in **(3b)**, per B&S). For B&S, a QVE verb quantifies over subquestions, so interrogative-embedding verbs uniformly denote $\langle\langle st, t\rangle, et\rangle$ objects (verbs like *know* being ambiguous); **(3a)** follows easily, but this predicts the acceptability of **(2)**.

RECONSIDERING THE DATA Beck & Sharvit offer, as a counterexample to the apparent fact that *wonder* is incompatible with QVE, exchanges like **(4a)**, in which Y's latter sentence has a meaning like that in **(4b)**, analogous to the interpretation of **(1)**. However, there are a number of empirical problems with their analysis. First, it relies on QVE being acceptable only in situations that guarantee an actual answer to *wonder*'s complement (a guarantee provided for *know* by its factivity). Nevertheless, the exchange in **(4a)** is acceptable even in the scenario in **(5)**, in which the "actual answer" to *which members voted for his tenure* is irrelevant to the truth of the statement. Second, the same sentence becomes unacceptable when an overt complement to *wonder* is given as in **(6)**—all the more odd, considering that *wonder* does not typically allow null complements at all, as in **(7a)**, and verbs that require overt complements require them even in the context *be mostly V-ing* as in **(7b)**. Essentially, what B&S discovered in **(4a)** is not a fact about QVE with *wonder*, but is rather an idiomatic fact about *be wondering* wholly independent of QVE.

Conversely, while B&S are correct that **(3b)** is infelicitous, the infelicity derives not from the verb being "used in a different sense when embedding a question" (p. 112), but rather from the generic use of the simple present and the pragmatics of a future-oriented verb. Note first that in the simple past, both sentences in **(3)** become unremarkable, as in **(8)**. In **(3)**, the embedded future tense is subject to the usual restrictions, such as (following Copley 2002) the presupposition of a plan and the existence of a "director" with the power and desire to enact the plan. Thus, while we can have a plan to decide who will be admitted, having a plan to decide that Fritz will be admitted is as anomalous as Copley's "the fix is in" sentences (such as *The Red Sox are beating the Yankees tomorrow*). This restriction, not a different sense of *decide*, makes **(3b)** infelicitous; putting the sentence in a context where having such a plan makes sense alleviates the infelicity, as in **(9)**.

FURTHER APPLICATIONS Once we give question-embedding in general and QVE in particular a single explanation, we can extend the analysis to other related phenomena. For instance, quantified concealed questions (DP complements rather than CP complements), as in **(10)**, have received much recent attention (Frana 2009, Romero 2009); if we can determine that QVE occurs with verbs that accept propositional complements, it may follow that concealed questions (when quantified, if not invariably) also only occur with the same verbs (cf Nathan 2006).

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Example Sentences[1]

(1) Sam mostly knows which states border Minnesota.
≈"For most states that border Minnesota, Sam knows that/whether they do."

(2) *Sam mostly wonders which states border Minnesota.
≠"For most states that border Minnesota, Sam wonders whether they do."

(3a) The committee mostly decides which candidates will be admitted.
≈"For most candidates, the committee decides whether they will be admitted." (B&S 2002, #25)

(3b) ?The committee decides that Fritz will be admitted. (B&S 2002, #26b)

(4a) X: Has Tom found out which committee members voted for his tenure?
Y: He knows that J voted in favor. But for the most part, he is still wondering. (cf B&S #133)
(4b) For most *x*, John is still wondering whether *x* voted in his favor.

(5) **Scenario:** a department of twenty members (A, B, C, D, ..., R, S, Tom), a tenure committee comprising A through J, but Tom believes the committee is J through S. Tom is up for tenure, and the committee voted last night, but as Tom hasn't heard the results yet, he's nosing around the department trying to learn how everyone voted (though of course he's trying to find answers to questions like "How did K vote? How did L vote?" that have no actual answers).

(6) #For the most part, Tom still wonders which committee members voted in his favor.

(7a) #Tom didn't know where to go for dinner, so he wondered.
(7b) #Tom had no idea who voted in his favor, {but he was mostly discovering/so I was mostly revealing}.

(8) The committee decided {who would be admitted/that Fritz would be admitted}.

(9) Here's what I expect will happen. Next week, the committee will decide that Fritz will be admitted. Then the dean, who has a vendetta against the letter "z", will overturn the decision.

(10) John knows most European capitals. ≈ "For most *x*, John knows whether *x* is a European capital"

Selected References

Beck, Sigrid and Yael Sharvit. 2002. "Pluralities of questions". *Journal of Semantics* 19: 105-157.
Copley, Bridget. 2002. *The semantics of the future*. Doctoral dissertation, MIT. Available from MIT Working Papers in Linguistics.
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Lahiri, Utpal. 2000. "Lexical selection and quantificational variability in embedded interrogatives". *Linguistics and Philosophy* 23: 325-389.

[1] Note that almost all the sentences with "mostly" have acceptable but irrelevant readings in which times or plural subjects are quantified over: "Most of the time, Sam wonders..." or "Most members of this committee decide....". Judgments reflect the sentences' abilities to have the relevant QVE reading.