De re readings of nested which-phrases in embedded questions

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It is well known that which-phrases give rise to de re/de dicto ambiguity (Groenendijk & Stokhof 1982, 1984, Rullmann & Beck 1998, Sharvit 2002, among others). For example, the de re reading of (1) doesn’t entail that the speaker’s son knows that the relevant books are Russian novels.

(1) My son knows which Russian novels I haven’t opened.

Suppose I reserve a part of my bookshelf for Russian novels, and my son doesn’t know what kind of books they are or who wrote them, but knows which ones I haven’t opened (e.g., because they are clean). In this situation (1) is true under the de re reading. The observations here and below hold for other question embedding predicates like ask, wonder, tell, etc., but I will focus on know for reasons of space.

Adding a prepositional phrase to the which-phrase does not matter, as in (2).

(2) My son knows which novels by Russian authors I haven’t opened.

The complex which-phrase here has a number of readings, but crucially, there is a reading where everything in the which-phrase is de re (which I call a ‘completely de re reading’). Only under this reading is (2) true in the above situation.

I observe that the completely de re reading disappears when the PP is also a which-phrase (a construction Heim 1994 calls ‘nested which-phrases’; also Elliott 2015). Thus, (3) is not true in the situation given above.

(3) My son knows which Russian novels by which author(s) I haven’t opened.

Standard views of de re/de dicto ambiguity of which-phrases do not offer a straightforward account of this (see von Stechow 1996:73 for related discussion). In fact, assuming that all novels have authors, they cannot even distinguish the completely de re readings of (1) and (3). Specifically, Karttunen’s (1977) theory and its descendants would analyze the completely de re readings of the embedded questions in (1) and (3) as follows:

(4) a. \( \{ \lambda w'. \neg \text{open}_w(\text{spkr}, x) : \text{Russian-novel}_w@x \} \)
   b. \( \{ \lambda w'. \neg \text{open}_w(\text{spkr}, x) : \text{Russian-novel}_w@x \land \exists y[\text{author}@y \land \text{by}@x.y] \} \)
Since all novels have authors, these two sets are equivalent. Consequently, (3) is predicted to be true in the above context where (1) is, contrary to fact. An analogous problem arises under other theories such as Groenendijk & Stokhof’s (1982, 1984) partition semantics, according to which, the embedded questions in (1) and (3) are translated into:

\[(5)\]

\[\begin{align*}
\text{a. } & \lambda w. \{w': \{x: \text{Russian-novel}_w(x) \land \neg \text{open}_w(\text{spkr}, x)\} = \{x: \text{Russian-novel}_w(x) \land \neg \text{open}_w(\text{spkr}, x)\}\} \\
\text{b. } & \lambda w. \{w': \{<x,y>: \text{Russian-novel}_w(x) \land \text{author}_w(y) \land \neg \text{open}_w(\text{spkr}, x)\} = \{<x,y>: \text{Russian-novel}_w(x) \land \text{author}_w(y) \land \neg \text{open}_w(\text{spkr}, x)\}\}
\end{align*}\]

This observation suggests that de re readings of which-phrases in embedded questions are constrained somehow. In particular, it seems that each wh-phrase must bind a variable in the body of the question, so to speak, so that it is not merely functioning as an indefinite. This would rule out (4b)/(5b). However, it is unclear where in the grammar this constraint should be enforced.

(491 words)

References
Heim, Irene (1994) Lecture Notes, MIT.