1. The scope of quantified elided answers

Consider the following question-answer pair:

(1) a. Which books must Jack read?
   b. The French or the Russian novels

(1)b can be understood in two ways:

(2) a. Jack must read the French novels or Jack must read the Russian novels (I don’t know which)
   b. Jack has the following obligation: reading the French novels or the Russian novels (it is up to him which)

This type of ambiguity is quite systematic, as illustrated below: the phrase *the French or the Russian novels*, if used as an answer to the following questions, can be either interpreted as taking maximal scope (*high reading*, as in (2)a) or as taking scope in the position from which the corresponding wh-phrase has been extracted (*low reading*, as in (2)b). The reader will check that the same is true for other quantified elided answers, such as *More than two novels by Balzac.*
(3) Which books did Jack demand that we read? The French or the Russian novels.

*high reading:* Jack demanded that we read the French novels, or he demanded that we read the Russian novels

*low reading:* Jack demanded that we either read the French novels or the Russian novels

(4) Which books is Jack certain that Mary read? The French or the Russian novels.

*high reading:* Jack is certain that Mary read the French novels, or he is certain that Mary read the Russian novels

*low reading:* Jack is certain that Mary either read the French novels or the Russian novels

(5) Which books does Jack expect Mary to read? The French or the Russian novels.

*high reading:* Jack expects Mary to read the French novels or he expects her to read the Russian novels

*low reading:* Jack expects Mary to either read the French novels or the Russian novels

(6) Which books is it sufficient to read? The French or the Russian novels.

*high reading:* it is sufficient to read the French novels or it is sufficient to read the Russian novels

*low reading:* it is sufficient to either read the French novels or the Russian novels

(7) Which books is Jack allowed to read? The French or the Russian novels.

*high reading:* Jack is allowed to read the French novels or he is allowed to read the Russian novels (implicature: Jack is not both allowed to read the French novels and allowed to read the Russian novels)
Low reading: Jack is allowed to read the French novels or the Russian novels (free choice interpretation: Jack is allowed to read the French novels and he is allowed to read the Russian novels)\(^1\)

Yet the low reading is not always available, as the following illustrates (I am again considering the possible readings of the elided answer *The French or the Russian novels*):

(8) Which books didn’t Jack read?
Unavailable: Jack didn’t read the French novels or the Russian novels (understood as “Jack read neither the French novels nor the Russian novels)

(9) Which books does Sue know that Jack read?
Unavailable: Sue knows that Jack either read the French novels or the Russian novels

(10) Which books does Sue know that Jack must read?
Unavailable: Sue knows that Jack must either read the French novels or the Russian novels

(11) Which books did Sue discover that Jack read?
Unavailable: Sue discovered that Jack either read the French novels or the Russian novels

(12) (?) Which books did Sue ask whether Jack read?
Unavailable: Sue asked whether Jack either read the French novels or the Russian novels

(13) (?) Which books does Sue wonder why Jack read?
Unavailable: Sue wondered why Jack either read the French novels or the Russian novels
The low reading is blocked when the following elements intervene between the surface position of the wh-phrase and its base position: negation, factive verbs, interrogative embedding verbs. This typology sounds familiar; namely, these are the elements that induce weak islands, i.e. those that block the extraction of some, but not all, interrogative phrases (how-phrases, degree-operators, adjuncts in general—see Huang 1983, Obenauer 1983, Chomsky 1986, Cinque 1990, Rizzi 1990). It thus turns out that an elided quantified answer cannot be interpreted in the position of the gap in weak-island environments. In the next sections, I argue that this constraint is a consequence of another one: namely, the low reading is licensed only when a particular reading for the underlying wh-question is available, a reading that is sensitive to weak-islands.

2. An unnoticed reading: wh-phrases as binding <<e,t>,t>>-variables

Consider again the question in (1), repeated as (14).

(14) Which books must Jack read?

According to Karttunen’s (1977) – henceforth K.- semantics for questions, the complete answer to (14), in a given world w, is the proposition expressed by the conjunction of all the statements of the form ‘Jack must read x’, with x a book, that are true in w, if there are such true statements; if, in w, there is no book x such that Jack must read x, then the complete answer is the proposition that states that there are no particular books that Jack must read. According to Groenendijk & Stockhof’s (1984) – henceforth G&S-
semantics, the complete answer to (14) is the proposition that states what the extension of the predicate \( \lambda x. (x \text{ is a book and Jack must read } x) \) is in \( w^2 \). Consider now the following situation: there are books on a table, call them A, B, C, etc. Jack’s actual reading obligations are as follows: he has to either read A and B, or C and D, and he has no other reading obligations. It follows that there is no particular book \( x \) such that Jack must read \( x \). As a result, both K. and G&S. predict that the complete answer in this case is expressed by *there are no books that Jack must read*. Yet a cooperative speaker who knows what Jack’s reading obligations are is likely to provide the answerer with the information that Jack must either read A and B, or C and D. This would actually correspond to the low reading of the elided answer ‘A and B, or C and D’, given as an answer to (14).

It is worth noticing that the proposition that Jack has to either read A and B or C and D is not even predicted to be an answer at all by K. and G&S. The truth of this proposition has indeed no implication whatsoever regarding the extension of \( \lambda x. (x \text{ is a book } \& \text{ Jack must read } x) \). Yet the possibility of such an answer does not as such undermine K. and G&S’s treatments. Indeed, answers often address a question that is different from the one that has been explicitly expressed; for instance, the speaker could well have chosen to answer a different question, e.g. *What are Jack’s reading obligations?*. More needs to be said in order to argue for the existence of a genuinely distinct reading of the underlying question.

The interpretation of wh-questions in embedded contexts provides a more direct argument. Consider the following scenario: Jack must either read A and B or C and D,
and has no other reading obligation. Sue knows that there is no particular book that Jack
must read, but she has no idea that he should read anything at all. Consider then the
following dialogues:

(15) Does Sue know which books Jack must read?

(16) a. Yes, she knows that Jack is not required to read any particular book.

b. No, she doesn’t know that Jack must either read A and B, or C and D.

Both (16)a and (16)b sounds like reasonable answers. Most theories of embedded
assume that a sentence of the form Sue knows Q, where Q is an interrogative clause, is
true in a world w if and only if Sue is in the relation know to the proposition that is the
complete answer to Q in w. Both G&S and K. predict that, in this particular scenario, the
complete answer to Which books Jack must read in the actual world is the proposition
expressed by “there is no book that Jack must read”. As a result (16)a is expected, but not
(16)b. (16)b would be expected if the complete answer to Which books Jack must read
entailed the proposition expressed by “Jack must either read A and B or C and D”.
Hence, so goes the argument, the complete answer to Which books must Jack read?
should actually entail this very proposition³.

If this argument is conclusive, we need to posit that questions such as (14) are truly
ambiguous between two readings. I suggest that these two readings can be informally
paraphrased as follows (hereafter, I will use the expressions high reading and low
reading to refer to readings of type (17)a and (17)b, respectively - and not only to the interpretation of elided answers):

(17)  a. For which books x, is it the case that Jack must read x?

b. For which generalized quantifier G over books, Jack must read G?

In fact, it is necessary to impose an additional restriction on the variable G. G should range over increasing GQs over books. The motivation for this restriction is the following. Suppose that Jack has to read at least two novels by Balzac, and is furthermore not allowed to read any novel by Nabokov, and that these are his only obligations. Then the strongest true statement of the form Jack has to read G, with G a GQ over books, is Jack must read at least two novels by Balzac and no novel by Nabokov. In the absence of any particular restriction, it is thus predicted that the sentence Sue knows which books Jack must read is true in this situation only if Sue knows that Jack must read at least two novels by Balzac and no novel by Nabokov. However, it seems that the sentence in question is true as soon as Sue knows that Jack must read at least two novels by Balzac. This fact is readily explained if we replace (17)b with the following:

(18)  For which increasing generalized quantifier G over books, is it the case that Jack must read G?
Let me offer a more formal rendering of this proposal. One possible implementation is to treat wh-phrases as ambiguous, as shown below (as in K., the denotation of a question is a set of propositions):

\begin{align*}
(19) \quad & a. \left[ (\text{Which NP}, S) \right] (w) = \lambda \phi_{<s,t>} . (\phi(w) = 1 & \exists x (x \in [[NP]] & [(S)]^{i \rightarrow x} = \phi)) \\
& b. \left[ (\text{Which NP})_G (S) \right] (w) = \lambda \phi_{<s,t>} . (\phi(w) = 1 & \exists X_{<s,t>} (X \text{ is increasing and its smallest live-on set belongs to } [[NP]] & [(S)]^{G \rightarrow x} = \phi)).
\end{align*}

These entries assume that wh-phrases bind variables that range either over individuals (as in a)), or over generalized quantifiers (as in b)). (19)a is basically identical to K.’s proposal: the denotation of *Which books must Jack read?* is, given (19)a, the set of all the true propositions of the form ‘Jack must read x’, with x standing for a particular book or a plural individual made up of books. According to (19)b, the denotation of the very same question is the set of all the true propositions of the form ‘Jack must read G’, with G an increasing GQ ranging over (groups of) books.

I now want to argue that the low reading of wh-questions (the one corresponding to (19)b) is absent in weak-island environments. Let me show this in the case of interrogative and factive islands (I don’t address negation here - see section 3 and note 5 in particular). Thus consider the following contrast:

\begin{align*}
(20) \quad & \text{Jack doesn’t know that Peter has to read more than two books by Balzac; therefore, he doesn’t know which books Peter has to read}
\end{align*}
(21) # Jack doesn’t know that Mary asked whether Peter has to read more than two books by Balzac; therefore, he doesn’t know which books Mary asked whether Peter has to read.

The naturalness of (20) shows that the low reading is, as expected, available for *What books Peter has to read*. Indeed, on the high reading, the fact that Jack doesn’t know that Peter has to read more than two books by Balzac is not enough to justify the conclusion that Jack doesn’t know which books Peter has to read. For suppose that Peter’s reading obligations are as follows: “read *War and Peace* and *Crime and Punishment*, and also more than two books by Balzac (you can choose)”; assume further that Jack knows that Peter has to read *War and Peace* and *Crime and Punishment*, that there is no other specific book that Peter has to read, but does not know that he has to read more than two books by Balzac. In such a situation, Jack doesn’t know that Peter has to read more than two books by Balzac, but he knows what the extension of \( \lambda x. (x \text{ is a book and Jack has to read } x) \) is; hence, on the high reading, it is in fact be true that Jack knows which books Peter has to read; therefore *Jack doesn’t know that Peter has to read more than two books by Balzac* does not entail *Jack doesn’t know which books Peter has to read* on the high reading, while it is clear that the entailment goes through on the low reading. In contrast with this, the oddness of (21) shows that the low reading is not available for *Which books Mary asked whether Peter has to read*. Indeed, if the low reading were available in this case, the fact that Jack doesn’t know that Mary asked whether Peter has to read more than two books by Balzac would be enough to justify the claim that Jack doesn’t know which
books Mary asked whether Peter has to read. The interpretation of embedded questions therefore confirms that the low reading is unavailable when an interrogative verb intervenes. Finally, the following contrast shows that factive verbs also block the low reading of embedded questions:

(22)  
a. Does Peter know which books Mary discovered that Jack read?

b.# No, he doesn’t know that Mary discovered that Jack either read the French novels or the Russian novels.

3. Interpreting elided answers

In view of the preceding discussion, the unavailability of the low reading of elided answers in weak-island environments might simply follow from the fact that this reading cannot count as an answer in such contexts, since the underlying questions do not themselves license the low reading in weak-island configurations. Yet such an account is insufficient. For consider the following question, together with two possible answers:

(23)  
a. Which books didn’t Peter read?

b. Either the Russian novels or the French novels

c. Peter didn’t read either the Russian or the French novels

As observed above, the elided answer (23)b cannot be interpreted as equivalent to the full answer (23)c (where disjunction takes narrow scope). But (23)c itself is certainly a
natural answer to (23)a. One might wonder why this is so, given that (23)a does not license the low reading. The fact that (23)c, on the narrow scope reading, counts as an answer, is actually fully expected: indeed, (23)c is equivalent to *Peter didn’t read the French novels and Peter didn’t read the Russian novels*, which is predicted to be an answer to (23)a on its *high* reading, which is by hypothesis the only possible one (“For which books X, is it true that Peter did not read X”). In fact, if Peter read every relevant book except the Russian and the French novels, then (23)c expresses the complete answer to (23)a on its high reading. But then the narrow-scope reading of (23)b (i.e. the proposition expressed by (23)c, if it existed, should clearly count as an answer as well.

What makes something count as an answer is only the proposition it expresses, not the way in which the proposition is expressed; in this case, the proposition expressed on the narrow-scope reading is predicted to count as an answer no matter what. This discussion suggests that more structural factors must be at play in determining the reading of elided answers. It is not enough to say that a certain reading is unavailable for an elided answer if it does not count as an answer (since in the case at hand, the missing reading would in fact count as an answer). A natural proposal is that elided answers are interpreted as yielding the proposition that results from combining them with the lambda-abstract created by wh-movement:

(24) If Q is a question of the form \([\textit{which NPs}]_K \phi(X_K)\), where \(X_K\) is either of type e or of type \(<<e,t>,t>\), then a quantified elided answer \(G_Q\) to Q is interpreted as:
(GQ_{<e,t>,t})(\lambda X_{k}. \phi(X_{k})) (GQ is the argument of \lambda X_{k}. \phi(X_{k}) if X_{k} is of type <e,t>,t>, but takes \lambda X_{k}. \phi(X_{k}) as its argument if \lambda X_{k} is of type e)

Suppose that a certain question licenses the low reading. Then on the low-reading, the variable X_{k} in the above representation is of type <e,t>, t>. As a result \lambda X_{k}. \phi(X_{k}) is of type <<<e,t>,t>, t> and takes GQ as its argument. So the actual interpretation will be \phi(GQ), where GQ takes narrow scope. On the high reading, things work the other way: \lambda X_{k}. \phi(X_{k}) is now of type <e,t>, and will be the argument of GQ, and the final interpretation is: GQ(\lambda X_{e}. (\phi(X)), where GQ takes \lambda X_{e}. (\phi(X)) as its argument, hence takes wide-scope.

In the case of a negative question like (23)a, as in other weak-island configurations, only the representation corresponding to the high reading is licensed, by hypothesis. So the only possible interpretation for the elided answer in (23)b is the wide-scope one, as shown below.

(25) a. [The Russian novels or the French novels]_{<e,t>,t>}(\lambda X_{e}. Jack did not read X)
   b. Jack did not read the Russian novels, or Jack did not read the French novels

It follows that the relation between the meaning of a wh-question and that of an elided answer is always mediated by the Logical Form of the wh-question. The low reading of an elided answer thus always corresponds to an LF representation for the wh-question in which the wh-operator binds a variable of type <e,t>,t>. And the absence of
the low reading in some question-answer pairs can then be plausibly related to some familiar weak-island effects that rule out the corresponding LF representation for the underlying wh-question.

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1 If “allowed” is treated as an existential quantifier over possible worlds and disjunction is given its standard semantics, the high reading and the low reading are equivalent. But in fact a narrow-scope disjunction triggers a free-choice interpretation, while a wide-scope disjunction tends to be interpreted as exclusive.

2 In both systems, as in much subsequent work, which-phrases are treated as binding an e-type variable. But works on functional and pair-list readings (e.g. Engdahl 1986, Chierchia 1991) have motivated approaches based on choice-functions. See also in this connection Reinhart (1992) and Romero (1999).

3 One could question the standard analysis of the semantics of embedded questions, and argue that \( X \text{ knows } Q \) is true if \( X \) knows \( S \), where \( S \) is a maximally *relevant* answer to \( Q \) in a broad sense. The fact that the interpretation of embedded questions is itself sensitive to weak-islands, as shown below, suggests that such an account, though independently defensible (see Ginzburg 1995a & 1995b, van Rooij 2003), cannot be the whole story.

4 A generalized quantifier \( G \) is (or ranges) ‘over \( P \)’, where \( P \) is a set of individuals, if \( P \) is the *smallest live-on set* of \( G \) (see Szabolcsi 1997), i.e. is the smallest set \( A \) such that \( \forall Y (Y \in G \Leftrightarrow (Y \cap A) \in G) \). For any conservative Det, the smallest live-on set of \( [[\text{Det NP}]] \) is \( [[\text{NP}]] \).
References


