Pair-List Answers without Movement
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I. A Movement Account of Pair List Answers

It is standard practice to use the appropriateness of answers as a heuristic in the analysis of questions. In this paper I want to focus on a particular type of question-answer paradigm to see whether this heuristic has been applied correctly. The paradigm I am interested in is the possibility of pair list answers to direct questions which have indirect questions as complements. The relevant example is given under (1):

(1) who knows [where Mary bought what]

This question, as pointed out originally by Baker (1970), can be answered quite appropriately with an individual answer such as (2a) or a pair list answer such as (2b):

(2) a. John does.
   b. John knows where Mary bought the book and Bill
      knows where she bought the pen.

Baker argued that the fact that there are two possible answers to (1) indicates that it is ambiguous. In spite of some initial debate, Baker's analysis has been widely accepted. Translated into current GB terms, the individual answer to (1) derives from an LF

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representation such as (3a) and the pair list answer from a representation such as (3b):

\[
(3a). \quad [\text{cp} \quad \text{who}, \quad ([\text{v}_{1} \ldots \text{t}_{1}] \ldots [\text{cp} \quad \text{what}, \quad \text{where}, \quad ([\text{v}_{2} \ldots \text{t}_{2} \ldots \text{t}_{n} \ldots])])]
\]

\[
(3b). \quad [\text{cp} \quad \text{what}, \quad [\text{v}_{1} \ldots \text{t}_{1}] \ldots [\text{cp} \quad \text{who}, \quad \text{where}, \quad ([\text{v}_{2} \ldots \text{t}_{2} \ldots \text{t}_{n} \ldots])])]
\]

In (3a) the embedded \textit{what} moves to lower spec, so that only \textit{who} is in matrix spec; in (3b) it moves long distance so that \textit{who} and \textit{what} are both present in matrix spec. Under the assumption that an answer provides values for all and only the wh expressions in matrix spec of a question, this analysis accounts for the question answer paradigm in (1) and (2).

It is worth pointing out that the essence of Baker's analysis of (1) is maintained even in frameworks which do not use wh movement and a level of LF to display scope relations. Engdahl (1986), for example, uses Cooper-storage to encode scope relations and Groenendijk and Stokhof (1984) use a form of quantifying in for the same purpose. In both these systems the pair list answer is derived by ensuring scope interaction between the matrix wh and the embedded wh at the matrix clause level. Though these theories do not use movement as such, they employ analogous scoping mechanisms to derive the ambiguity. In this respect, their analyses of pair list answers to questions like (1) are equivalent to the movement account.

In this paper I will present data which shows that the movement account is not universally viable. I will then present an alternative account which derives the pair list answer without moving the embedded wh to matrix spec. Finally, I will argue that the non-movement account is to be preferred since it has greater cross-linguistic applicability.

II. The Need for an Alternative

The crucial piece of evidence against a movement account for questions like (1) comes from Hindi, a language in which wh expressions remain in-situ. A striking fact about Hindi \textit{wh} is that it can only take narrow scope when it occurs inside a finite complement. (4), for example, can only be interpreted as an indirect question:

\[
(4) \quad \text{raam jaantaa hai meri ne kahaa kyaa khariliada Ram knows meri where what bought "Ram knows what Mary bought." NOT "What is such that Ram knows where Mary bought it?"
}
\]

This is unexpected, given what we know about Chinese \textit{wh} in-situ. The Chinese counterpart of (4) is ambiguous between a direct and an indirect question reading. Huang (1982) explained the ambiguity in the following way. Since the verb \textit{know} can take a plus or a minus \textit{wh} complement, the embedded \textit{what} is free to move at LF to the lower or the higher spec, yielding the two readings. Clearly, finite clauses in Hindi are different from Chinese in that they are scope islands for \textit{wh} interpretation. In Srivastav (1989) and (1991) I have shown that Hindi finite clauses are syntactic adjuncts and that extraction is ruled out as a subjacency violation. Davison (1984) and Mahajan (1987) and (1990) provide alternative explanations. For the purposes of this discussion it is not important to choose between the various accounts. We need only accept it as a descriptive fact that movement of Hindi \textit{kyaa} "what" to the higher spec is ruled out in (4) and that the only well-formed LF for it is (5a).

\[
(5a). \quad [\text{cp} \quad ([\text{v}_{1} \ldots \text{t}_{1}] \ldots [\text{cp} \quad \text{what}, \quad ([\text{v}_{2} \ldots \text{t}_{2} \ldots \text{t}_{n} \ldots])])]
\]

\[
(5b). \quad [\text{cp} \quad \text{what}, \quad ([\text{v}_{1} \ldots \text{t}_{1}])]
\]

(6) further illustrates this fact:

\[
(6) \quad \text{raam jaantaa hai meri ne kahaa kyaa khariliada Ram knows meri where what bought "Ram knows where Mary bought what." NOT "What is such that Ram knows where Mary bought it?"
}
\]

Interestingly, however, the Hindi counterpart of (1) can be answered with a pair list. So in (7) we have:

\[
(7) \quad \text{kaun jaantaa hai merine kahaa kyaa khariliada who knows merine where what bought "Who knows where Mary bought what?"
}
\]

And this is easily answered by an individual answer or with a pair list answer. Under the movement account the pair list answer would have to derive from an LF like (8), where the lower wh moves up into matrix spec:

\[
(8) \quad [\text{cp} \quad \text{what}, \quad [\text{v}_{1} \ldots \text{t}_{1} \ldots \text{t}_{n} \ldots [\text{cp} \quad \text{who}, \quad ([\text{v}_{2} \ldots \text{t}_{2} \ldots \text{t}_{n} \ldots])]])]
\]

But we know, of course, from (4) and (6) that this is not possible in Hindi. It would be completely ad hoc to posit movement out of the finite complement in (7) while preventing such movement in (4) and (6). The pair list answer, clearly, has to be accounted for without scope interaction of the kind assumed.

III. A Non-Movement Account of Hindi Pair List Answers

Let us take (9) as the only well formed LF of the Hindi question in (7), and (10) as its translation:

\[
(9) \quad [\text{cp} \quad \text{who}, \quad ([\text{v}_{1} \ldots \text{t}_{1} \ldots \text{t}_{n} \ldots [\text{cp} \quad \text{what}, \quad ([\text{v}_{2} \ldots \text{t}_{2} \ldots \text{t}_{n} \ldots])])]
\]

\[
(10) \text{"Who knows where Mary bought what?"
}
\]
(9) \[ \text{for } \psi \text{ who}_1, \text{ who}_2, \ldots, \text{ who}_n \text{ what, where}\]

(10) \[ \lambda \psi \exists x (\psi' \land \text{know'(x, } \lambda \psi \forall y \exists z (\psi' \land \text{know'(x, y, at z)})])\]

Now, an answer to this question can only provide values for kaun "who", following the standard assumption that an answer only provides values for those wh's which have matrix scope. We know that a wh expression like who allows for one or more individuals to be specified in the answer. Suppose, I answer (7) with John and Bill, I am giving an individual answer which uses a plural term to identify the matrix subject. If we take the indirect question in (7) to denote a set of propositions as in Karttunen (1977), we can say that the group of individuals picked out by the plural term John and Bill stands in a particular relation to a set of propositions. The answer letter is the set of individuals who know \( \psi' \); \( \psi' = \text{know'}(x, \lambda \psi \forall y \exists z (\psi' \land \text{know'(x, y, at z)})\])

(11) Two boys ate three apples

has a distributive reading which says that two boys each ate three apples as well as a cumulative reading which says that they jointly ate three apples. The point I am making is that this distinction also applies to the answer which derives from the LF in (9), since both arguments of the verb can denote groups.

There are some interesting consequences of treating pair list answers in terms of the distinctions introduced by Scha. Take a question like (12), which is like (7) in that it is a direct question with an indirect question complement:

(12) kaun lākāhā jaantā hai marīne kaun kitāb which boy knows Mary which book kharildi bought "Which boy knows which book Mary bought?"

The difference with (7) is that the two arguments of know can no longer refer to groups. The matrix wh is kaun lākāhā "which boy" and carries a uniqueness implication typical of wh expressions of the form which \( W \), so that there can only be one individual picked out by the wh expression. An indirect question can only contain one proposition, namely the one which identifies the unique book Mary bought. Since the answer to (12) does not relate plural objects, no ambiguity between distributive and cumulative readings is possible. Put another way, if the semantic answer picks out John, for example, as the individual who knows the proposition Mary bought War and Peace, there is no meaningful sense in which we can talk about the distributive - cumulative distinction. Since pair list answers, under the proposed account, is a way of canceling the implicature that the relation between the matrix subject and the indirect question object is distributive by making the cumulative reading explicit, it is predicted that a pair list answer to (12) will not be available. This is indeed the case.

Note that it is not obvious how a pair list answer for (12) can be ruled out by the movement account. Remember that we are dealing here with a wh in-situ. Presumably, there would have to be some way of overriding the fact that Hindi finite clauses are scope islands in order to account for the pair list reading of (7) but in that case, it should also be possible to extract kaun kitāb "which book" out of the definite complement in (12) and move it to matrix spec. If there is scope interaction between "which boy" and "which book" at the matrix clause level, however, we should be able to get a pair list answer, which we do not. Thus the contrast between (7) and (12) argues for the non-movement account.

The semantics for questions which I adopt here is a
modification of Karttunen’s (1977) semantics, developed in Srivastav (1991). Though it is not possible to discuss the motivations behind the modification, let me briefly mention one crucial aspect of the modification which impacts on the topic under discussion. All questions are treated as denoting sets of propositions, just as in Karttunen. A restriction is imposed, however, which ensures that a question with a single wh expression will have only one proposition in the set, while a question with more than one wh expression will allow for one or more propositions to be included in it. The restriction to singleton sets holds in the case of questions with one wh expression of the form what or who, as well as in the case of those with one wh of the form which book or which boy. Consider the question in (13):

(13) kaun jaanta hai merine kyaa kharididaa
who knows Mary what bought
"who knows what Mary bought?"

Though (13) has kyaa "what" in place of kaun kisname "which book", the indirect question would still denote a set with only one member even if Mary bought two books. It would contain the proposition Mary bought Emma + Ivanhoe, where Emma + Ivanhoe picks out a plural individual in the sense of Link (to appear) and Landman (1989 and 1990). What this means for purposes is that pair list answers in the context under discussion will be available when there is a multiple embedded question and unavailable when the embedded question has only one wh expression, whether it is of the form N or what. This prediction is borne out. It is possible to give pair list answers to (7) but not to (12) or (13).

To sum up so far, I have outlined an alternative for Hindi in which a pair list answer results from long distance movement of the embedded wh but represents a cumulative reading of an individual answer. It draws on the fact that cumulative readings require plural objects. This explains the absence of pair list answers when the matrix wh picks out a single individual and the indirect question has only one wh, that is, when it denotes a singleton propositional set. Under this view, the pair list answer to (7) does not provide values for who and what. It provides values for who but values for what are used to identify the different propositions in the set.

IV. Cross-linguistic Implications

If we consider the non-movement account just sketched for pair list answers to Hindi questions like (7), we notice that it does not make reference to any feature specific to Hindi. It is based essentially on a semantic distinction between distributive and cumulative readings of sentences with two plural arguments.

The next point to consider is surely obvious. If pair list answers in a language like Hindi can be obtained without movement, do we need a movement account at all? One could say, of course, that both cases are available cross-linguistically and languages may differ in this respect. As a general strategy, however, a parametric approach is warranted only in the face of observed variation between languages; otherwise, a uniform analysis is always to be preferred. We have seen that the movement account posited for languages like English does not extend to languages like Hindi. Let us see if we can determine the non-movement account posited for Hindi applies to other languages.

Consider a long-standing problem for the movement account, noted by Kuno and Robinson (1972). They observed that questions like (14) also allow for a pair list answer, on a par with (1):

(14) Who knows where Mary bought these books?
(15) John knows where Mary bought Emma and Bill knows where she bought Ivanhoe.

(14) does not have a wh-in-situ in the embedded clause, instead it has a universal term these books. Since the pair list cannot be derived through movement of a wh-in-situ in this case, it was argued by Kuno and Robinson, it indirectly undermines the movement account of pair list answers for (1).

The possibility of (15) as an answer to (14) is a potential problem for the present account, as it stands. I have distinguished so far single and multiple embedded questions in terms of their plurality -- multiple wh questions may denote plural sets while single wh questions must denote singleton sets. The embedded question in (14), however, is special. Questions which have a wh expression and a universal term are known to allow for multiple pairings in the answer in this sense they are equivalent to multiple wh questions. This equivalence has been captured in different ways by May (1985), Engdahl (1986), Groenendijk and Stokhof (1984), and Chierchia (1991). Given any of these accounts, an embedded question of this particular form will be able to denote a plural propositional set and the availability of the pair list answer for (14) is predicted under the present view, on a par with (1). The movement account, on the other hand, simply does not address the similarity between (1) and (14) with respect to pair list answers.

Let us turn next to some other languages where the movement account fails to predict the availability of pair list answers. Take the case of languages in which the scope of embedded wh is transparent at S-structure: Rudin (1986) shows that in Romanian and Bulgarian, two languages in which multiple wh movement obligatorily takes place and in which movement is to spec of CP, not
to an IP adjoined position. The Bulgarian counterpart of English (1) or Hindi (7) is given in (16):

(16) kof znac kakvo kade e kupila Mariya
    who knows what where has bought Maria
"Who knows where Maria bought what?"

The two native speakers I consulted easily got pair list answers for (16). Under the movement account, this is a problem because LF movement is standardly assumed to originate from argument positions. In the case of Bulgarian, the pair list answer would have to involve spec to spec movement of kakvo "what". The problem, however, is not simply a theoretical one; it cannot be empirically motivated. Consider a question like (17) which also has kakvo in embedded spec:

(17) kof znac kakvo e kupila Mariya
    who knows what has bought Maria
"Who knows what Maria bought?"

If it is possible to motivate movement from this position in (16), it should also be possible to motivate it in (17) since the matrix verb znac "knows" does not require a +wh complement. (17), however, does not allow for a pair list answer.

Under the movement account, then, there is no principled way of explaining the possibility or impossibility of pair list answers when the embedded wh is in embedded spec position at S-structure. Under the non-movement account developed for Hindi, on the other hand, the Bulgarian facts are actually predicted. The indirect question in (16), but not in (17), can denote a set which may contain more than one proposition. That is, the question in (16) represents a relation between plural objects and may therefore have a cumulative reading; the question in (17) represents a relation between a plural subject and a singleton prepositional set so that a cumulative reading is ruled out.

The same facts hold for Russian, another language in which all wh's are obligatorily moved at S-structure — (18) allows for a pair list answer while (19) does not:

(18) kto znac gdje cto Mariya kupila
    who knows where what Maria bought
"Who knows where Maria bought what?"

(19) kto znac cto Mariya kupila
    who knows what Maria bought
"Who knows what Maria bought?"

To motivate movement in Russian, one would have to assume that "who" is a higher lexical constituent which can then move to spec, or that the wh is an operator which moves to spec. However, these possibilities are not available in the non-movement account.

Nishigauchi (1986) argues that Japanese wh in-situ obeys the wh island constraint by showing that a question like (22) cannot be interpreted with the embedded wh "what" having matrix scope:

(22) Tanaka-kun-wa [Mary-ga doko-de nani-o kat-ta ka]
    Tanaka Mary where what bought Q
    "Does Tanaka know where Mary bought?"

Note that the embedded ka in (22) can bind doko "where", so that it should be possible for matrix ka to bind nani "what". That it cannot, shows that the scope of nani is fixed at the embedded clause level. So the facts of (22) are the following: the embedded question morpheme binds both embedded wh and the only interpretation that the matrix question morpheme can yield is a yes/no interpretation.

Let us replace Tanaka with dare "who", as in (23), giving us the couterpart of English (1) and Hindi (7):

(23) dare-ga [Mary-ga doko-de nani-o kat-ta ka]
    who Mary where what bought Q
    sitte-imasu ka
    know Q
"Who knows where Mary bought what?"

In the appropriate situation (23) yields a pair list answer. Under the movement account this contradicts the conclusion based on (22) that Japanese wh in situ is subject to the wh island constraint. Under the non-movement account the pair list answer for (23) is quite expected.

The non-movement account is further confirmed by the fact that the pair list answer becomes unavailable if the...
embedded question has only one wh expression:

(24) dare-ga [Mary-ga nani-o kat-ta ka] sitte-imasu ka
    "Who knows what Mary bought?"

The absence of a pair list answer to (24) is predicted, on a par with Hindi (13), since the embedded question does not denote a plural object.

(25) and (26) show that similar facts hold in Chinese. (25) has a multiple question in embedded position and allows for a pair list answer, (26) has a single wh expression in the embedded question and does not allow it:

(25) nei xie ren zhidao mari zai nali nai-le sheme
    which people know mary where bought what
    "Which people know where Mary bought what?"

(26) nei xie ren zhidao mari nai-le sheme
    which people know mary bought what
    "Which people know what Mary bought?"

What we see, then, is significant uniformity across languages on the availability of pair list answers. The data from English, Bulgarian and Russian, languages with distinct overt movement strategies, and from Hindi, Japanese and Chinese, in-situ languages with distinct scope properties, converge on this point. Since wh movement varies across these languages it seems problematic to capture this uniformity within a movement based account. The non-movement account, on the other hand, depends on semantic properties which are universal and predicts precisely the kind of convergence we see.

V. Conclusion

To sum up, I have presented evidence from Hindi that argues against the standard view that pair list answers to questions like (1) involve long distance movement. I have developed an alternative account which treats this phenomenon in terms of a semantic distinction between distributive and cumulative readings of two plural terms. And I have presented arguments to show that there is reason to accept this account not only for Hindi but for other languages as well.

REFERENCES


2 The absence of the pair list answer for (24) is, of course, also ruled out by the movement account since the embedded ka will necessarily bind the embedded wh.

3 The fact that (27) does not allow for a pair list answer is surprising, since Chinese wh inside finite complements are supposed to be able to take matrix scope.