QP and WH-Scope Interaction[*]
(wh - 의문문의 양화사와 의문사의 Scope 상호작용)

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Abstract

There has been two proposals regarding QP and wh-scope interaction. One is that a single answer as a pair list answer is derived from the scope interaction between the QP and the wh-word as proposed by May (1985). The other is that both readings are special cases of a functional answer as claimed in Engdahl (1985) (and also Chierchia 1991). In this paper, I suggest that the single answer is wide scope of the wh-word over the QP and the pair list answer is a special case of the functional answer, taking an eclectic view of the two proposals.

1. Introduction

It has been proposed by May (1985) and many others that a single answer as well as a pair list answer is the result of scope

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interaction between a QP and a wh-word. Whereas, Engdahl (1986) claims that the two readings are special cases of a functional answer. In this paper, I suggest that the single answer is wide scope of the wh-word over the QP, while the pair list answer is a special case of the functional answer. My claim is based on the observation that scrambled wh-questions in Korean admit a single answer but not a functional answer.

2. May (1985)

Wh-question in (1) below can be answered at least in two ways as given in (2).

(1) Who did every man invite?

(2) a. Mary
   b. Jim invited Jane, Philippe invited Chris and Joseph invited Sally.

May (1985) argues that the single answer in (2a) and the pair list answer in (2b) are derived from scope interaction between QP and WH-word. To be specific, the single answer is wide scope of the wh-word over the QP and the pair list answer is wide scope of the QP over wh-word. The two readings in (2) for the wh-question in (1) are informally notated below in (3).

(3) a. Who is the person x such that every man invited x?
      (single answer)
    b. As for every x, who is the person y such that x invited y?
      (pair list answer)

May's claim for the wide scope of the QP over the wh-word as the source of the pair list answer is problematic, however, especially given the following example in (4) in English:

(4) Who do you think everyone saw at the rally?(May 1985: 45)

The above question in (4) admits a pair list answer in addition to the single answer. If wide scope of the QP over the wh-word is the source of a pair list answer, one needs to assume quantifier raising of the universal QP out of the embedded CP, which is not plausible, however, given that tensed CP complement clause never allows a universal QP such as *everyone* to scope out of it (see Beghelli 1997 and Reinhart 1997 among others, for the related discussion).

3. Engdahl (1986)

Engdahl (1986) claims that a functional answer is paradigmatic and that both the single answer and the pair list answer are special cases of the functional answer, hence denying wide scope of the QP over the wh-word as the source of the pair list answer

(also see Chierchia 1991, 1993).[1] According to her, the question in (1) can be answered by saying *his mother* in case it is the function that constitutes a true short answer to (1). She suggests that the wh-trace has a complex structure with a free variable, which is an argument of a function mapping individuals to individuals, i.e., Skolem function. Wh-phrase in Spec of CP is argued to have a variable quantifying over this function. The wh-question in (1) repeated in (5) is thus understood as asking for 'what function f is such that every man x invited $f(x)$?' in her system:[2]

    (5) Who did every man invite?

    (6) a. his mother
       b. Mary
       c. Jim invited Jane, Philippe invited Chris and Joseph invited Sally.

  The single answer in (6b) to the question in (5), obtains when the function is a constant function mapping *every individual* onto *Mary* and the pair list answer in (6c) to the question in (5) obtains when the speaker is not satisfied with the intension, i.e.,

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1) Chierchia (1991, 1993) also argues pair list answer and single answer are special cases of a functional answer, inspired by the proposal of Engdahl (1986), hence denying wide scope of the QP over the wh-word as the source of the pair list answer.
2) Engdahl's proposal for the semantics of wh-questions is essentially based on the proposal of Karttunen (1977) according to which the denotation of a wh-question is set of true propositions.

the function that holds for the group, but the extension, i.e., ordered set of pairs <Jim, Jane>, <Philippe, Chris>, <Joseph, Sally>.

Given her proposal, the empirical problem of May (1985) with regard to the example in (4) can be avoided since pair list answer is not the wide scope of the QP over the wh-word but is a special case of a functional answer. Engdahl's claim for the functional answer as the source of both the single answer and the pair list answer is too strong, however, crucially since scrambled wh-questions in Korean admit only a single answer, as will be shown in section 5.

4. Proposal

I suggest that the single answer is the wide scope of the wh-word over the QP, following May (1985), among others. I will, however, take the view that the pair list answer is a special case of the functional answer a la Engdahl (1986), thus denying wide scope of the QP over the wh-word as the source of the pair list answer. With no wide scope of the QP over a wh-word, the wh-word should invariably have wide scope over the QP, like Engdahl (1986). I will also assume that quantifier raising is essentially driven by the need to avoid type mismatch, following Pesetsky (1982), Heim & Kratzer (1998), and Fox (2000) among others. I will further assume the intuition in Chomsky (1964: 38),

Katz and Postal (1964: 93), Klima (1964: 253) and Kuroda (1969: 266ff), according to which the *wh*-word is a combination of wh-operator and some.

Now let us turn to the sentence in (1=(5)) to show specifically how the answers are derived. Suppose the wh-word *who* that consists of a wh-operator and indefinite *someone* is decomposed into a wh-operator and *someone* at LF such that the latter is reconstructed in the sense of Heim (1987). The representation for (1=(5)) after reconstruction will be the following in our system:[3]

(7) $[_{CP}$ wh$_i$ $[_{IP}$ $[_{IP}$ QP $[_{VP}$ invited $[_{DP}$ t$_i$ $[_{NP}$ someone]]]]]]

Since *someone* in (7) is an indefinite, it should have its quantificational force determined by an external quantificational element for proper interpretation. Thus depending on whether the indefinite is bound by the QP or the wh-operator, the representation in (7) will have two different LF representations below in (8). [4] [5]

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3) Let us assume that who has a DP structure where the trace of wh-operator is sitting in Spec of DP.

4) The index of the DP is the result of spec-head agreement in DP and subsequent percolation from the head of DP into its maximal projection.

5) The internal structure of a wh-trace has drawn much interest recently in the investigation of QP and wh-word scope interaction. Sloan (1991:233), for example, suggests that wh-word consists of a wh-operator and a null anaphoric pronoun. Sloan argues that a pair list answer arises when a QP locally licenses the null anaphoric pronoun.

(8) a. [$_{CP}$ wh$_i$ [$_{IP}$ [$_{IP}$ QP [$_{VP}$ invited [$_{DP}$ t$_i$ [$_{NP}$ someone$_i$]]]]]]]

b. [$_{CP}$ wh$_i$ [$_{IP}$ [$_{IP}$ QP$_j$ [$_{VP}$ invited [$_{DP}$ t$_i$ [$_{NP}$ someone$_j$]]$_i$]]]]]

In (8a), the indefinite is bound by the wh-operator, hence ending up with a wh-interrogative reading. One may thus understand the LF representation in (8a) as a question asking for 'what is the individual x such that every man invited x?' One may thus answer the question by saying *John*. In (8b), the indefinite is bound by the QP and the t_i that is a function taking the indefinite as its argument is bound by the wh-operator. Intuitively, one may understand the LF representation in (8b) as a question asking 'what is the function f such that every man x invited $f(x)$?' Hence, one can answer the question by giving a functional answer *his mother* in case it is the function constituting a true short answer to (1=(5)).

I will thus suggest that a single answer obtains when a wh-operator binds the indefinite *some* part of the wh-word and takes scope over the QP and that a functional answer obtains when the QP c-commands the indefinite part of the wh-word and the wh-operator binds the DP, assuming c-command in terms of the first branching node in the sense of Reinhart (1976: 32) as the syntactic notion of scope.

How is the pair list answer derived in (1=(5))? I suggest that the pair list answer derives as a special case of the functional

answer, essentially following Engdahl (1986) (and also Chierchia (1991, 1993). However, the detail differs. Since the indefinite part that is the argument of the function is bound by the definite QP, the hearer then can answer the question by giving list of pairs to the question in (1=(5)), given that a definite QP involves a shared knowledge of the set denoted by the QP between the hearer and the speaker. The same account can apply to the example in (4), which I will leave to the reader.

Before closing the section, some difference between the proposal of Engdahl (1986) on the one hand and the one in the present system on the other should be noted. Engdahl proposes that the trace of a wh-word is complex with a free variable. In our approach, the wh-word is a complex structure containing an indefinite, which obtains straightforwardly as a result of LF wh-reconstruction. Moreover, it will be shown that the structure of a wh-word as consisting of a wh-operator and an indefinite will find additional cross-linguistic support when it comes to Korean, which I will turn to in section 4.

5. Wh-Questions in Korean

A growing body of researchers has suggested that wh-words in Korean type languages cannot be treated on a par with wh-words in English, since wh-words in the former type languages can have

different interpretations, depending on the context where they occur (Nishigauchi 1990, Kim 1991, Cheng 1997, and Choi 2002 among others). When it comes to Korean, Choi (2002) claims that wh-words other than *way* (why) is an indefinite in the sense of Lewis (1975) and Heim (1982), in that they show quantificational variability and can scope out of a syntactic island (see Choi 2002 for the data and discussion).

He thus claims the indefinite wh-word is interpreted in situ as a wh-interrogative as in (9) below: The question morpheme with a [+WH, +Q] feature specification (QM, henceforth) serving a wh-operator unselectively binds and thus marks the scope of the indefinite wh-word at LF (see Baker 1970, Cheng 1997), assuming LF is the only level for semantic interpretation, following Chomsky (1995).

(9) Ne-nun   [John-i   nwukwu-lul
    you-TOP   J-NOM   whom-ACC
    mannassta-ko]   sayngkakha-ni?
    met-COMP   think-QM
    'Who do you think John met?'

He further suggests that QM is base-generated in the head of IP, crucially based on the fact that it is part of the verbal morphology as shown in (10), given the recent proposals of the strict projectionist hypothesis (Pollock 1989, and Chomsky 1993, among others), viewing the IP system as an extension of the VP

system, with each inflectional morpheme of the verb projecting a separate functional projection.

(10) John-i   **nwukwu**-lul   manna-ss-*(ni)?
J-NOM   whom-ACC   meet-PAST-(QM)
'Who did John meet?'

He thus suggests that the QM, which is part of the verbal morphology, should not project in the CP domain in the sense of Rizzi (2000) but IP right over TP given the order of the verbal morphology above in (10). He argues that the claim for the base position of QM is further supported by the independent analysis made by Kim (1991), according to which the QM in Korean is claimed as base-generated in the head of IP, mainly based on the fact that QM does not show a complementary distribution with the quotative marker, *ko* (that), which projects CP as shown in (11).

(11) John-un   [Mary-ka   **mwus**-ul
J-TOP   M-NOM   what-ACC
sat-nya-ko]   muletta.
bought-QM-COMP   asked
'John asked what Mary bought.' (Kim 1991:227)

Assuming the proposals in Choi (2002) and Kim (1991) regarding the position of the QM as essentially correct, now let us turn to scope interaction in Korean wh-questions.[6] Consider the

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6) I would like to direct the reader to Kim (1991) for additional arguments for the base-position of the QM in the head of IP.

following wh-question with a QP in the subject position in (12):

(12) (?)Motun salam-i   nwukwu-lul
     every man-NOM   whom-ACC
     chotayhayss-ni?
     invited-QM
     'Who did everyone invite?'

The above wh-question in (12) is more or less acceptable, admitting a single answer and a functional answer, but with no pair list answer (also see Kim 1991 for Korean and Hoji 1985 and Hagstrom 1998 for Japanese).[7] It is quite interesting that why the pair list answer is not a possibility for the wh-question above in (12), given that the corresponding one in English in (1=(5)) as repeated in (13) below admits a pair list answer.

(13) Who did everyone invite?
     Jim invited Jane, Philippe invited Chris and
     Joseph invited Sally.

At this point, please recall our proposal for the position of the QM in the head of IP as illustrated in (14) below and that it serves a wh-operator marking the scope of the indefinite wh-word. Throughout, I will use a head-initial notation for Korean

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7) I should acknowledge, however, that the intuition as reported here is not uncontroversial. Suh (1990), Joo (1989), and Choi (2002), for example, observe that examples like (12) can admit a pair list answer, too. The reviewer also points out that (12) admits pair list answer.

for the reader's convenience.

(14) [IP [I' QMi [V WH-wordi]]]

Please recall that given the semantics of Karttunen (1977) for wh-questions, and no wide scope of the QP over the wh-word, wh-operator should invariably have scope over the QP, which means that the QP in the subject position above in (15) should be construed as a scopally inert expression. i.e., group construal. [8) 9) 10)] Now we need to show how the single answer and the functional answer to the wh-question in (13) are derived in our system. Depending on whether the indefinite is bound by the QP or by the wh-operator, the sentence will have two different LF representations below in (15).

(15) a. [CP [IP QP [I' QMi [VP invited [DP [NP someonei]]]]]]
    b. [CP [IP QPj [I' QMi [VP invited [DP [NP someonej]]i]]]]

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8) A QP is scopally inert if it does not show distributivity and variation. Thus it follows that a universal QP is scopally inert once it has a group interpretation, given that this type of QP has only one witness set.

9) The reviewer wonders why the QP in (14) should be scopally inert. Without wide scope of the QP over the wh-word, the semantics of wh-questions (Karttunen 1977) forces the QP to be scopally inert, assuming c-command in terms of the first branching node (Reinhart 1976: 32) as syntactic notion of scope.

10) One may wonder why the QM in the head of IP in (14) is not raised into the head of CP such that the LF for the wh-question eventually has the right semantics. It should be pointed out, however, that there is no reason for the movement of the QM into the head of CP, since the indefinite is already bound by the QM as it is.

The LFs in (15ab) are for the single answer and the functional answer, respectively. In (15a), the indefinite *someone* is bound by the QM for proper interpretation, which is a wh-operator. It is thus interpreted as a wh-interrogative and the question is essentially asking for 'who is the person x such that everyone invited x?' In (15b), the indefinite someone is bound by *everyone* and the DP is bound by the wh-operator. It is hence understood as a wh-question asking for 'what is the function f such that everyone invited $f(x)$?' Accordingly, one may simply answer the question by giving a functional answer, which is a generalization holding for the group *everyone*. Pair list answer is not a possibility, because *everyone* is scopally inert for the reason as mentioned above.

Next let us turn to so called scrambled wh-questions in Korean. Consider the following so called 'scrambled wh-question' where the wh-word is in sentence initial position, which is not a canonical wh-question in Korean. This type of wh-question admits only a single answer. To the extent that the intuition is correct, it crucially suggests that the proposal of Engdahl (1986) (and also see Chierchia 1991), according to which a single answer as well as a pair list answer is a special case of a functional answer is too strong.

(16) **Nwukwu**-lul   motun   salam-i
     whom-ACC   every   man-NOM
     chotayhayss-ni?
     invited-QM

'Who did everyone invite?

Although it is an issue of debate whether the wh word at the surface position is due to overt movement or base-generation, I will assume the wh-word in (16) is base-generated, following (Choi 2002). One may assume it is base-generated in IP adjoined position or in Spec of Topic Phrase (see Choi 2002 for more discussion for this). Whichever option one wishes to opt for does not affect the analysis here. For expository purpose, I will simply assume the first option. The LF representation for the sentence in (16) will be the one below in (17).

(17) [$_{CP}$ [$_{C'}$ QM$_i$ [$_{IP}$[$_{DP}$ [$_{NP}$ someone$_i$]] [$_{IP}$ QP [$_{I'}$ t$_i$ [$_{VP}$ invited]]]]]]

The QM in the head of IP should be raised into the head of CP from which it can bind the indefinite wh-word in IP-adjoined position. Otherwise the indefinite will not have a binder, yielding no proper interpretation. Please note that the other LF representation where the QP binds the indefinite and the wh-operator binds the DP is out of the question since the QP in Spec of IP cannot c-command the indefinite, given the proposal for the type driven QR as adopted here. It should be reminded that functional answer obtains when the QP binds the indefinite and the wh-operator binds the DP including the indefinite and that pair list answer derives as a special case of functional answer when the QP is definite. Now let us turn to double object construction. Observe the

following example below in (18):

(18) Ne-nun   motun   salam-ekey   **nwukwu**-lul
     you-TOP   every   man-DAT   whom-ACC
     sokayhayhayss-ni?
     introduced-QM
     'Who did you introduce to everyone?'

The wh-question above in (18) is acceptable, admitting a single answer, a pair list answer and a functional answer. The sentence will have the following two LF representations, depending on whether the indefinite is bound by the QP or the wh-operator:

(19) a. [$_{CP}$ [$_{IP}$ NP [$_{I'}$ QM$_i$ [$_{VP}$ introduced QP [$_{DP}$ [$_{NP}$
        someone$_i$]]]]]]
     b. [$_{CP}$ [$_{IP}$ NP [$_{I'}$ QM$_i$ [$_{VP}$ introduced QP $_j$ [$_{DP}$ [$_{NP}$
        someone$_j$]]$_i$]]]]

The LF in (19a) is for the single answer and the one in (19b) is for the functional answer.

Now the question is why the wh-question in (18) can admit a pair list answer in contrast to the one in (12), which also has a definite QP in construction with the indefinite wh-word. The reason is that the QP in (18) does not have to be scopally inert to yield the right semantics for the wh-question, since the QM in the head of IP already takes scope wider than the QP. Pair list answer thus obtains as a special case of a functional answer from (19b)

since *everyone* is quantificational. The reader should be reminded that with no quantification into questions and given the semantics of wh-questions by Karttunen(1977), wh-operator should necessarily have scope wider than the QP.

Finally let us turn to embedded wh-questions. Wh-question below in (20) with the QP in the embedded subject position is acceptable, admitting a single answer, a pair list answer and a functional answer.

(20) Ne-nun   [motun   salam-i   **nwukwu**-lul
     you-TOP every   man-NOM   whom-ACC
     chotayhayss-ta-ko]   sayngkakha-ni?
     invited-COMP   think-QM
     'Who do you think everyone invited?'

The sentence in (20) will have the following LFs in (21), depending on whether the indefinite wh-word is bound by the wh-operator or by the QP.

(21) a. [$_{CP}$ [$_{IP}$ NP V [$_{CP}$ [QP [$_{I'}$ QM$_i$ [$_{VP}$ invited [$_{DP}$
        [$_{NP}$ someone$_i$]]]]]]]]
     b. [$_{CP}$ [$_{IP}$ NP V [$_{CP}$ [QP $_j$ [$_{I'}$ QM$_i$ [$_{VP}$ invited [$_{DP}$
        [$_{NP}$ someone$_j$]]$_i$]]]]]]

As one can notice, the LF in (21a) is for the single answer and the one in (21b) is for the functional answer. The pair list answer obtains as a special case of the functional answer from (21b), since *everyone* is quantificational. Please note that the QP does

not have to be scopally inert for the right semantics for the wh-question, since the QM in the matrix clause already takes scope wider than the QP in the embedded subject position.

6. Conclusion

To summarize, I suggested that the single answer is wide scope of the wh-word over the QP, whereas a pair list answer is a special case of a functional answer. I diverged from May (1985) in that wide scope of the QP over wh-word is not the source of the apir list answer. I also diverged from Engdahl (1986) in that the single answer is a reading independent of the functional answer. The present proposal against Engdahl is crucially based on the intuition that scrambled wh-questions in Korean admit a single answer but not a functional answer.

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