Intervention Effects are Focus Effects*

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1 Introduction

Beck (1996) and Beck & Kim (1997) discuss the interaction between *wh*-in-situ and negation and other quantifiers and propose the Minimal Quantified Structure Constraint (MQSC) which basically says that an intervening quantifier blocks LF movement of *wh*-in-situ (I will call this type of blocking effect an "Intervention Effect", following terminology of Hagstrom 1998 and Pesetsky 1999).

In this paper, I will show that the MQSC is too strong a constraint in the sense that not every quantifier seems to show the Intervention Effect in Korean. Analyzing negative polarity items in Korean as focus phrases, I argue that what produces an Intervention Effect is not negation or quantifiers in general, but rather focus phrases. Assuming with Reinhart (1998) that the

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wh-in-situ is a function variable bound by the question existential operator (Q-operator), I propose that a focus phrase may not intervene between a Q-operator and the *wh*-in-situ bound by that Q-operator.

2 LF Intervention Effects

The generalization made by Beck (1996) and Beck & Kim (1997) is that an intervening quantifier blocks LF movement of *wh*-in-situ to an operator position.[1]

2.1 German

In German, sentences are ungrammatical when the *wh*-in-situ is c-commanded by a quantifier at surface structure.

(1) is a normal multiple *wh*-question in the unmarked order with the subject preceding the adjunct.[2]

(1) Wen hat Karl wo getroffen?
whom has Karl where met
'Who did Karl meet where?'

However, sentences are ungrammatical when a quantifier c-commands the *wh*-in-situ. When the *wh*-in-situ is scrambled over the intervening quantifier, the sentences become grammatical. This contrast is illustrated in (2) – (4) (the quantifiers are marked in boldface, and *wh*-in-situ is underlined).[3]

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[1] Beck's (1996) Intervention Effect applies not only to *wh*-in-situ, but also to the stranded restriction of the overtly moved *wh*-phrases and *wh*-scope marking constructions. In this paper, however, I will only concentrate on *wh*-in-situ cases.

[2] Unlike Korean, which optionally allows *wh*-scrambling, German does not allow *wh*-scrambling in normal contexts (see Fanselow 1990, Müller & Sternefeld 1993, among others). So, the example (i), which is minimally different from (1) in that the *wh*-in-situ *wo* 'where' is scrambled in front of the subject, is ungrammatical:

(i) *Wen hat wo_i Karl t_i getroffen?
whom has where Karl met
'Who did Karl meet where?'

It is interesting to note that there are some contexts in which German allows *wh*-scrambling. The intervention context is one of those, and the otherwise impossible *wh*-scrambling is allowed to repair the ungrammaticality. I would like to refer the reader to Heck & Müller (2000) for a promising optimality-theoretic analysis of the "repair-driven movements".

[3] Beck (1996) notes that the judgments for sentences like those in (2) – (4) are somewhat subtle: "The '??' means that the data are incomprehensible (uninterpretable) rather than

(2) a. ?? Wen hat **niemand** wo gesehen?
whom has nobody where seen
b. Wen hat wo **niemand** gesehen?
whom has where nobody seen
'Who did nobody see where?'

(3) a. ?? Wen hat **nur** **Karl** wo getroffen?
whom has only Karl where met
b. Wen hat wo **nur** **Karl** getroffen?
whom has where only Karl met
'Who did only Karl meet where?'

(4) a. ?? Wen hat **fast** **jeder** wo getroffen?
whom has almost everyone where met
b. Wen hat wo **fast** **jeder** getroffen?
whom has where almost everyone met
'Who did almost everyone meet where?'

Based on this, Beck (1996) proposes the generalization that an intervening quantifier blocks LF *wh*-movement. So the following configuration is ruled out where t_i^{LF} stands for a trace created by LF-movement.

(6) *[... X_i ... [Q ... [... t_i^{LF} ...]]]

This constraint on LF movement is formalized as follows:

(7) a. *Quantifier-Induced Barrier (QUIB)*:
The first node that dominates a quantifier, its restriction, and its nuclear scope is a Quantifier-Induced Barrier.
b. *Minimal Quantified Structure Constraint (MQSC)*:
If an LF trace β is dominated by a QUIB α, then the binder of β must also be dominated by α.

To put it in plain words, LF movement of *wh*-in-situ may not cross a c-commanding quantifier.

To show how the MQSC works, we take the cases (2a-b) and look at the LFs which are given in (8a-b). At LF, the *wh*-in-situ *wo* 'where' moves to the SpecC position and leaves an LF trace t_j^{LF}.

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simply ungrammatical." The same effect is observed with the Korean data (which I marked with '?*') to be discussed in the next subsection.

(8) a. LF for (2a):

[$_{CP}$	wen$_i$	wo$_j$	[$_{C'}$ C [$_{IP}$ niemand	t$_i$	t$_j^{LF}$	gesehen	hat]]]
	whom	where	nobody			seen	has

b. LF for (2b):

[$_{CP}$	wen$_i$	wo$_j$ [$_{C'}$ C [$_{IP}$	t$_j^{LF}$ [$_{IP}$	niemand	t$_i$ t$_j$	gesehen	hat]]]]
	whom	where		nobody		seen	has

The crucial difference between the LFs (8a) and (8b) lies in the positions of the trace left by the LF movement of the *wh*-in-situ (*wen* 'whom' is moved already at S-Structure in both cases, so its trace does not carry the super-script LF and is not subject to the MQSC). In (8a), the LF trace is located in a position c-commanded by the negative quantifier *niemand* 'nobody', and in (8b), it is outside the c-command domain of the quantifier. In (8a), the intervening negative quantifier *niemand* 'nobody' induces a QUIB, the IP. The LF trace t_j^{LF} of wo_j is dominated by this QUIB, but the binder of that trace is not. Thus (8a) violates the MQSC. On the other hand, in the grammatical LF (8b), there is no intervening quantifier between wo_j and its LF trace t_j^{LF}, thus there is no violation of the MQSC.

2.2 Korean

Discussing the scope of *wh*- and quantifier scope in Korean, Beck & Kim (1997) propose that Beck's (1996) generalization applies to Korean, too, which is a *wh*-in-situ language (see Hoji 1985 for a similar conclusion for Japanese and S.-W. Kim 1991 for Korean).

(9a) is a normal *wh*-question in the unmarked word order. In addition, Korean allows optional *wh*-scrambling as in (9b). Both options are grammatical.[4]

(9) a.

Suna-ka	muôs-ûl	sa-ss-ni?
Suna-Nom	what-Acc	buy-Past-Q

b.

muôs-ûl$_i$	Suna-ka t$_i$	sa-ss-ni?
what-Acc	Suna-Nom	buy-Past-Q

'What did Suna buy?'

When a negative polarity item (henceforth, NPI) *amuto* 'anyone' c-commands the *wh*-in-situ, however, the sentence is ungrammatical. When the *wh*-in-situ is scrambled to a position that is higher than the NPI, the sentence becomes grammatical, as shown in (10b).

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[4] Throughout this paper, I use the McCune-Reischauer system of romanization to transcribe Korean examples, except that I will use the diacritic ˆ instead of ˘ .

(10) a. ?* **amuto** muôs-ûl sa-chi anh-ass-ni?
anyone what-Acc buy-CHI not do-Past-Q
b. muôs-ûl$_i$ **amuto** t_i sa-chi anh-ass-ni?
what-Acc anyone buy-CHI not do-Past-Q
'What did no one buy?'

Phrases with focus particles such as *man* 'only' or *to* 'also' also show the same effects, and we observe the same repair effect by scrambling.[5]

(11) a. ?* **Minsu-man** nuku-lûl manna-ss-ni?
Minsu-only who-Acc meet-Past-Q
b. nuku-lûl$_i$ **Minsu-man** t_i manna-ss-ni?
who-Acc Minsu-only meet-Past-Q
'Who did only Minsu meet?'

(12) a. ?* **Minsu-to** nuku-lûl manna-ss-ni?
Minsu-also who-Acc meet-Past-Q
b. nuku-lûl$_i$ **Minsu-to** t_i manna-ss-ni?
who-Acc Minsu-also meet-Past-Q
'Who did Minsu, too, meet?'

And finally, universal quantifiers such as *nukuna* 'everyone' seem to show a similar effect, although the effect is much weaker.[6]

(13) a. ?(?) **nukuna-ka** ônû kyosu-lûl chonkyôngha-ni?
everyone-Nom which professor-Acc respect-Q
b. ônû kyosu-lûl$_i$ **nukuna-ka** t_i chonkyôngha-ni?
which professor-Acc everyone-Nom respect-Q
'Which professor does everyone respect?'

Based on this observation, Beck & Kim (1997) conclude that in Korean, too, quantifiers seem to block LF *wh*-movement.

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[5] See König (1991) for a broad comparative study of focus particles and Bayer (1999) for a recent syntactic analysis of focus particles such as *only* and *even*.

[6] It is well-known that the corresponding English question is ambiguous. The universal quantifier *everyone* can take either narrow scope below the *wh*-phrase (yielding a single answer) or wide scope over the *wh*-phrase (yielding a pair-list answer). Interestingly, questions with a universal quantifier in Korean do not allow pair-list answers. What is available is only a single answer or a functional answer. This seems to imply that the universal quantifier cannot take scope over the *wh*-phrase in Korean.

Reasonable as this generalization may seem, however, a closer scrutiny reveals some problems with it, which will be discussed in the following section.

3 Not Every Quantifier Shows the Intervention Effect

One problem with the claim by Beck & Kim (1997) is overgeneralization. As briefly mentioned above, we have a somewhat weaker effect with the universal quantifier *nukuna* 'everyone' (see (13a)). More problematic is the fact that no intervention effect is observed with some quantifiers. For example, the quantifier phrase *taepupun-ûi N* 'most N' and quantificational adverbs such as *hangsang* 'always' and *chachu* 'often' in Korean do not show any intervention effects. The following sentences with these quantifiers c-commanding the *wh*-in-situ are all grammatical.

(14) **taepupun-ûi hansaeng-tûl-i** nuku-lûl hoichang-ûlo
most-Gen student-PL-Nom who-Acc president-as
ch'uch'ônha-ôss-ni?
recommend-Past-Q
'Who did most students recommend as president?'

(15) Minsu-nûn **hangsang/chachu** nuku-lûl p'at'i-e teliko ka-ss-ni?
Minsu-Top always/often who-Acc party-to take-Past-Q
'Who did Minsu always/often take to the party?'

Beck & Kim (1997) already mentioned that it is not the full class of quantificational expressions that blocks LF movement in Korean. But a full explanation as to what natural class can be made up out of the interveners in Korean is lacking to date.

Interveners such as NPIs and focus phrases with particles *man* 'only' or *to* 'also, even' show intervention effects without exceptions (see (10) – (12)).[7] It is interesting to note that focused phrases even without any focus particle exhibit the same effect, which is illustrated in (16).

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[7] Lee & Tomioka (2000) claim that intervention effects disappear in embedded contexts, both in Japanese and Korean. But I myself do not share this intuition about Korean. So the sentence (ia) is still ungrammatical for me:

(i) a. ?* Suna-nûn [Minsu-to/man nuku-lûl ch'otaeha-ôss-ta-ko] saengkakha-ni?
Suna-Top Minsu-also/only who-Acc invite-Past-Dec-C think-Q
b. Suna-nûn [nuku-lûl$_i$ Minsu-to/man t_i ch'otaeha-ôss-ta-ko] saengkakha-ni?
Suna-Top who-Acc Minsu-also/only invite-Past-Dec-C think-Q
'Who does Suna think that also/only Minsu invited t?'

(16) a. ?* MINSU-ka nuku-lûl p'at'i-e ch'otaeha-ôss-ni?
Minsu-Nom who-Acc party-to invite-Past-Q
b. nuku-lûl$_i$ MINSU-ka t_i p'at'i-e ch'otaeha-ôss-ni?
who-Acc Minsu-Nom party-to invite-Past-Q
'Who did MINSU (not someone else) invite to the party?'

Taken together with the overgeneralization problem, one question to raise would be whether it is possible to distinguish a natural class among the interveners in Korean. The crucial question seems to be: Why do NPIs and focus phrases show the same intervention effect? What do NPIs have in common with focus phrases? In the next section, I first extend the discussion to include Hindi, and then look at the morphological structure of NPIs in Korean and show that NPIs share an interesting property with focus phrases.

4 The Structure of Negative Polarity Items

4.1 Hindi

Lahiri (1998) observes that negative polarity items (NPIs) in Hindi are morphologically made up of an indefinite existential or a weak predicate and a focus (or "emphatic") particle *bhii* that means 'also' or 'even'. The following list shows the NPIs and the corresponding simple existentials:

(17) The morphology of Hindi NPIs (Lahiri 1998: 58)

ek bhii	'anyone, even one'	ek	'one'
koii bhii	'anyone, any (count)'	koii	'someone'
kuch bhii	'anything, any (mass)'	kuch	'something, a little'
kabhii bhii	'anytime, ever'	kabhii	'sometime'
kahiiN bhii	'anywhere'	kahiiN	'somewhere'

One interesting property of NPI-licensing in Hindi (and also languages like Japanese and Korean), as opposed to languages like English, is the fact that in Hindi NPIs in subject position are licensed by clausemate negation. This is illustrated in (18) (compare (18a) with the ungrammatical English sentence **Anyone didn't come*).

I have no explanation why in Japanese and Korean (for some speakers) the intervention effect disappears when the question is embedded. I refer the reader to Lee & Tomioka (2000) for a critical and interesting reanalysis of the data in Beck & Kim (1997).

(18) a. koii bhii nahiiN aayaa
anyone not came
'No one came.'

b. maiN-ne ek bhii aadmii-ko nahiiN dekhaa
I-Erg any man not saw
'I didn't see any men/man.'

4.2 Korean

NPIs in Korean have a very similar structure to Hindi NPIs. In particular, they also contain the scalar focus particle *to* meaning 'also, even' (see Y.-S. Lee 1993 and C. Lee 1997).[8] Korean exhibits two types of negative polarity items, one based on an indefinite expression and the other based on a *wh*-pronoun. This is illustrated in (19) and (20).

(19) indefinite + *to* 'also/even'

a. han salam-to an o-ass-ta.
one person-even not come-Past-Dec
'No one came.'

b. amu-to kû ch'aek-ûl ilk-chi anh-ass-ta.
any-even that book-Acc read-CHI not do-Past-Dec
'No one read that book.'

c. Suna-nûn amu-to an manna-ss-ta.
Suna-Top any-even not meet-Past-Dec
'Suna didn't meet anyone.'

(20) wh + *to* 'also/even'

a. Suna-nûn nuku-to an manna-ss-ta.
Suna-Top who-also/even not meet-Past-Dec
'Suna didn't meet anyone.'

b. Suna-nûn ônû haksaeng-eke-to kû ch'aek-ûl
Suna-Top which student-Dat-also/even that book-Acc
chu-chi anh-ass-ta.
give-CHI not do-Past-Dec
'Suna didn't give the book to any student.'

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[8] For a detailed semantic analysis of NPIs in Hindi and Korean, I refer the reader to Lahiri (1998) and Y.-S. Lee (1993), respectively.

Taking into consideration that the *wh*-pronouns in Korean can be interpreted as indefinite pronouns in some contexts, it is not surprising to have the NPI type (20).[9]

Given this similarity, it seems reasonable to assume that NPIs in Korean are focus phrases like Hindi NPIs.

5 Focus Phrases and Intervention Effects

After having analyzed Korean NPIs as focus phrases, we can now assume that focus phrases in general show intervention effects in Korean.[10] In the next subsections, I will try to formalize this generalization and give some cross-linguistic evidence for it.

5.1 Interpreting Wh-in-situ without LF Movement

It is a long-standing question whether there is LF movement of *wh*-in-situ or not (from the early pioneering work by Huang 1982 to the recent minimalist program by Chomsky 1995). Beck (1996) and Beck & Kim (1997) assume that for semantic reasons, *wh*-in-situ has to move at LF to an operator position in SpecC. However, there is an alternative way to formulate the Intervention Effect without assuming LF movement of *wh*-in-situ. Discussing the Intervention Effect, Pesetsky (1999) proposes an alternative formulation which does not assume LF phrasal *wh*-movement, which is given in (21):

(21) *Intervention Effect* (Pesetsky 1999: 88)
A semantic restriction on a quantifier (including *wh*) may not be separated from that quantifier by a scope-bearing element.

For interpreting *wh*-in-situ without LF movement, we could take the choice function analysis proposed by Reinhart (1997, 1998). The determiner *which*, or the *wh*-expression in general, is interpreted as a choice function variable, which is long-distance bound by the question existential operator Q in SpecC. The existential question operator is introduced in the LF component via a sort of existential closure, so that no LF movement at all is involved.

The description of choice functions is given in (22):

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[9] Cf. Haspelmath (1997) for the typology of NPIs. The 'indefinite/wh + *also/even*' combination is a very common form of NPI cross-linguistically.

[10] See Sohn (1995) for a similar observation with focus phrases for Korean, and Yanagida (1996) for Japanese.

(22) A function f is a choice funtion (CH(f)) if it applies to any non-empty set and yields a member of that set.

(Reinhart 1997: 372)

According to Reinhart's analysis, the question (23a) is illustrated informally in (23b), and its semantic representation is given in (23c) (putting aside the issue of extensionality):

(23) a. Which lady t read which book?
b. for which <x, f> (lady(x)) and (x read f(book))
c. {P|(∃ <x, f>) (CH(f) & lady(x) & P = ^(x read f(book)) & true(P))}

The question here denotes the set of true propositions P, each stating for some lady x and for some choice function f that x read the book selected by f.

Turning now to *wh*-in-situ in Korean, we can apply the same procedure. Following Reinhart, I assume an abstract existential question operator in SpecC of the interrogative clause. Now, the Korean interrogative sentence (24a) can be semantically represented as in (24b). The choice function bound by the question operator selects a value from the student set denoted by the NP *haksaeng* 'student' (**Q** = question existential operator).

(24) a. [$_{CP}$ **Q**$_i$ [$_{IP}$ Suna-ka ônû haksaeng-ûl$_i$ manna-ss]-ni]?
Suna-Nom which student-Acc meet-Past-Q
'Which student did Suna meet?'
b. {P|∃f (CH(f) & P = ^(Suna met f(student)) & true(P))}

The question here denotes the set of true propositions P, each stating for some choice function f that Suna met the student selected by f.

5.2 Focus Phrases as Barriers for Q-Binding

Assuming with Reinhart (1998) that the *wh*-in-situ is a function variable bound by the question existential operator Q in SpecC, I propose that a focus phrase may not intervene between a Q-operator and the *wh*-in-situ bound by that operator. This is formulated as in (25):

(25) If a *wh*-in-situ α is c-commanded by a focus phrase β, then the Q-operator binding α must also be c-commanded by β.

The following structure (26) is then ruled out by the restriction (25) (the boldfaced **Q** is the existential Q-operator and "FocP" stands for Focus Phrase):

(26) * [$_{CP}$ **Q$_i$** [$_{IP}$ ... FocP ... wh$_i$ ...]]

Consider now the examples (11a-b), which are repeated as (27a-b).

(27) a. * [$_{CP}$ **Q$_i$** [$_{IP}$ Minsu-man nuku-lûl$_i$ manna-ss]-ni]?
Minsu-only who-Acc meet-Past-Q

b. [$_{CP}$ **Q$_i$** [$_{IP}$ nuku-lûl$_i$ [$_{IP}$ Minsu-man t manna-ss]]-ni]?
who-Acc Minsu-only meet-Past-Q
'Who did only Minsu meet?'

In the ungrammatical case (27a), the focus phrase *Minsu-man* 'only Minsu' intervenes between the Q-operator and the *wh*-in-situ bound by it. In the grammatical case (27b), on the other hand, there is no intervening focus phrase.

5.3 Some Cross-Linguistic Evidence for Focus Barriers

In Chinese, another *wh*-in-situ language, ordinary quantifier NPs, frequency adverbials, and negation do not show the Intervention Effect (see Huang 1982: 263–67 and Aoun & Li 1993a,b). The following examples with these quantifiers c-commanding the *wh*-in-situ are all grammatical.

(28) meigeren dou mai-le shenme?[11]
everyone all buy-ASP what
'What did everyone buy?'

(29) Zhangsan changchang mai shenme?
Zhangsan often buy what
'What does Zhangsan often buy?'

(30) Zhangsan bu xiang mai shenme?
Zhangsan not want buy what
'What doesn't Zhangsan want to buy?'

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[11] Aoun & Li (1993b) contrast sentences like (28) with the ungrammatical Japanese sentence (i) from Hoji (1985):

(i) * Daremo-ga nani-o kaimasita ka?
everyone-Nom what-Acc bought Q
'What did everyone buy?'

Interestingly, focus phrases (including NPIs) in Chinese do show the Intervention Effect (Lansun Chen, p.c.). Moreover, Chinese seems to have a repair strategy to circumvent the Intervention Effect. This is illustrated in the following examples.

(31) a. ?Lili ye kan-le na-ben shu?
Lili also read-ASP which-CL book
b. na-ben shu Lili ye kan-le?
which-CL book Lili also read-ASP
'Which book did Lili, too, read?'

(32) a. ?? lian Lili ye kan de dong na-ben shu?
even Lili also read DE understand which-CL book
b. na-ben shu lian Lili ye kan de dong?
which-CL book even Lili also read DE understand
'Which book could even Lili understand?'

(33) a. ?* zhiyou Lili kan-le na-ben shu?
only Lili read-ASP which-CL book
b. na-ben shu zhiyou Lili kan-le?
which-CL book only Lili read-ASP
'Which book did only Lili read?'

(34) a. * shei ye kan bu dong na-ben shu?
who also read not understand which-CL book
b. na-ben shu shei ye kan bu dong?
which-CL book who also read not understand
'Which book could no one understand?'
(*shei ye* 'who also' meaning 'anyone')

Notice that the NPI *shei ye* 'who also' in (34) has the same morphological structure as one type of the Korean NPIs (wh + *to* 'also'). Unlike Japanese or Korean, which exhibit a relatively free word order derived by scrambling, Chinese has a rather fixed word order. But exactly in the context where a focus phrase occurs in a position c-commanding the *wh*-in-situ in the unmarked order, the *wh*-in-situ has to be fronted to the sentence-initial position in order to get a grammatical sentence. Irrespective of what kind of movement it could be, it is important to note that focus phrases in Chinese show the Intervention Effect, as well.

6 Conclusion

In this paper I have reviewed the claim made by Beck (1996) and Beck & Kim (1997) that quantifiers block LF movement of *wh*-in-situ. One of the problems with this claim is that not all quantifiers show the Intervention Effect in Korean. This seems to imply that there is some cross-linguistic variation as to what blocks LF *wh*-movement (or Q-binding of *wh*-in-situ in the sense of Reinhart 1998). One question to raise was whether it is possible to distinguish a natural class among the interveners.

It is interesting to note that negative polarity items (NPIs) show the Intervention Effect quite generally (to be observed in Bengali, Chinese, Hindi/Urdu, Korean, and Turkish). Taking into consideration that NPIs in Korean consist of an indefinite expression and a focus particle *to* that means 'also, even', just like Hindi NPIs, the interveners in Korean can be classified as focus phrases. Given this, I proposed that focus phrases (not quantifiers in general) may not intervene between a Q-operator and the *wh*-in-situ bound by that operator. I further provided some evidence for focus barriers from Chinese.

One remaining question is why there is cross-linguistic variation among the interveners. For example, why does the universal quantifier in German show a stronger Intervention Effect than the corresponding Korean quantifier *nukuna* 'everyone'? Why is there no Intervention Effect with the universal quantifier in Chinese? Of course, the analysis I proposed in this paper does not provide a full explanation of the phenomena. But one natural class of interveners that produces the Intervention Effect quite generally could be found, namely focus phrases.

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