Acquisition of Scope Interaction of Universal Quantifiers and Negation in Korean-English Bilingual Children

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1. Introduction

Under the assumption that bilingual language acquisition is constrained by the principles of Universal Grammar, just as monolingual acquisition is, it can be predicted that bilingual children should pass through the same developmental stages as monolingual children. However, bilingual children are exposed to a much wider range of grammatical possibilities, given the input from two different languages. In addition, they can be exposed to structural possibilities which are not available to monolingual children. According to the cross-linguistic influence hypothesis (influence from one language on the other, which is argued by Paradis and Genesee (1995)), the two languages in a bilingual context might not be processed in isolation from each other. Cross-linguistic influence need not manifest as mixing or fusion, but it could emerge as facilitation/acceleration, delay or transfer (Paradis and Genesee 1995).

In this paper, I examine Korean-English bilingual children’s acquisition of scope interpretation of quantified NPs, especially when they interact with negation. Recently, monolingual children’s interpretation of universal quantifiers has been studied by many researchers (Philip 1995; Musolino 1998; Kim et al. 2003; Han et al. 2006). They agree that children often differ from adults in the way they comprehend sentences using quantified NPs (QNs). Musolino (1998) argues that unlike adults, English-speaking children show a strong preference for isomorphic readings of the QNs in interaction with negation, which follow the linear order from left to right on the surface form. In other words, English speaking children allow only the linear scope readings, where QNs take scope over negation in the subject position (subject QNs > neg), but negation takes scope over object QNs (neg > object QNs). Kim et al. (2003) also support children’s isomorphism by concluding that Korean-speaking children are also initially restricted to isomorphic readings of QNs with negation in Korean language acquisition. Since the
linear word order of Korean sentences (subject QNP, object QNP, negation) is not the same as in English (subject QNP, negation, object QNP), the isomorphic scope interpretations of Korean monolinguals do not follow those of English speaking children: namely, both subject QNPs and object QNPs take scope over negation in Korean isomorphic readings. In this paper, I investigate whether bilingual children speaking Korean and English are also restricted to the isomorphic reading in scope interpretation of QNPs and negation, as monolingual children are claimed to be.

The semantic knowledge of scope interaction between quantifiers and negation may not be easy for language acquirers because they have to acquire it without explicit evidence. Furthermore, English and Korean differ with respect to scope interaction of QNPs and negation. In English, only a narrow scope reading of QNPs is possible when they are placed in the object position (e.g. *John didn’t read every book (neg>every, *every>neg)) while both a wide scope reading and a narrow scope reading are allowed for subject QNPs (e.g. Every student didn’t read the book (every> neg, neg>every)). On the other hand, the scope interpretation of QNPs varies depending on negation type in Korean. In Korean, negative sentences can be formed in two types, short form negation and long form negation. In short form negation, only a wide scope reading of QNPs is available regardless of their grammatical position, whereas both a wide scope reading and a narrow scope reading are available in long form negation regardless of position. The mismatched scope interpretation between the two languages follows from the syntactic difference, specifically the distinct negation structures in each language. It is argued that English negation is formed by projecting its own functional projection, NegP, whereas Korean negation is formed by adjoining negation directly to V\(^0\) or VP. K-E bilingual

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1 Examples of short form negation and long form negation are as follows:

a. Chelswu-ka ppang-ul an mek-ess-ta “Short-form negation”
C-Nom bread-Acc NEG eat-PST-Decl
‘Chelswu did not eat the bread’

C-Nom bread-Acc eat-ci NEG-PST-Decl
‘Chelswu did not eat the bread’

See section 3 for details.
children are acquiring two languages (Korean and English), where the semantic information is interpreted based on different structures, so their acquisition of the distinct negation structure of each language will be crucial in order to get the relevant semantic knowledge in each language. Considering the mismatched negation structures between the two languages, bilingual children may show different developmental patterns for the scope interpretation of QNPs and negation from monolingual children by transferring the negation structure from one language to the other, assuming cross-linguistic influence.

Based on experimental studies, I test the cross-linguistic influence hypothesis in acquisition of scope interaction in K-E bilingual children in this paper. My research starts from the following questions: (i) Is bilingual children's language development distinct from monolingual children's development in terms of semantic knowledge? (ii) Do K-E bilingual children have patterns which manifest cross-linguistic influences such as facilitation, delay, or transfer in acquisition of scope interaction of QNPs and negation? (iii) If they have transfer, does it work in only one direction from one language to the other or in both directions?

The article is organized as follows. In section 2 and 3, I discuss the linguistic background about QNPs and negation in English and in Korean respectively. In section 4, I review the previous relevant studies on monolingual children’s acquisition of scope interaction of QNPs and negation for the sake of comparison between the monolingual and the bilingual. In section 5, I present experiments with K-E bilingual children on Korean and on English with the results of scope judgment based on the Truth Value Judgment Task (Crain and Thornton 1998). I consider what the results tell us about bilingual acquisition of scope interaction of QNPs and negation and how the results compare to monolingual acquisition data. Furthermore, I discuss cross-linguistic influences manifested in K-E bilingual children.

2. **Scope interaction of negation and quantifiers in English**

In English, it is well known that the scope of argument quantifiers is ambiguous between the surface scope reading and the inverse scope reading, as illustrated in example (1).
A professor loves every student.

‘There is a professor who loves every student’ (∃>∀: Surface scope reading)

‘Every student is loved by a (different) professor’ (∀>∃: Inverse scope reading)

According to May (1985), scope ambiguity occurs due to movement at Logical Form (hereafter, LF), quantifier raising (QR). The inverse scope reading is derived by raising the object every student over the subject a professor at LF and adjoining it to an A’-position, leaving a variable in the base position, as represented in (2).

(2) \[ [\text{TP every student}_1 [\text{TP a professor}_2 [\text{VP t}_2 \text{loves t}_1]]] \]

Following May (1985), Aoun & Li (1993) propose the principles in (3), (4) and (5) to account for distinct cross-linguistic scope interpretation of quantifiers among Chinese, Japanese and English.

(3) The Minimal Binding Requirement (MBR) (A&L:19)
Variables must be bound by the most local potential antecedent (A’-binder)

(4) The Scope Principle (A&L:88)
An operator A may have scope over an operator B iff A c-commands B or an A’-element co-indexed with B.²

(5) Optionality of QR (A&L : 83)
QR applies optionally to a QP in an non-thematic position (θ’-position) and obligatorily to a QP in a thematic position (θ-position)

² A&L adopt Reinhart’s definition of c-command (A&L:201): Node A (constituent)-commands node B iff the branching node α₁ most immediately dominating A either dominates B or is immediately dominated by a node α₂ that dominates B, and α₂ is of the same category type as α₁.
A & L also follow the VP-internal subject hypothesis (Kitagawa (1986); Koopman and Sportiche (1991); Kuroda (1988)), and they assume that subjects in English are base-generated in Spec, VP and raise to Spec, TP. Thus, the LF representations for the ambiguous scope readings of argument quantifiers in the sentence (1) are as follows:

(6)  
\begin{align*}
\text{a. Surface Scope} & \quad \left[ \text{TP}\ a\ \text{professor}_2 \left[ \text{TP}\ t_2 \left[ \text{VP}\ \text{every}\ \text{student}_1 \left[ \text{VP}\ t_2 \quad \text{loves}\ t_1 \right] \right] \right] \right] \\
\text{b. Inverse Scope} & \quad \left[ \text{TP}\ \text{every}\ \text{student}_1 \left[ \text{TP}\ a\ \text{professor}_2 \left[ \text{VP}\ t_2 \quad \text{loves}\ t_1 \right] \right] \right]
\end{align*}

(6a) represents the surface scope reading ($\exists\forall$). Both QNPs undergo QR: the subject a professor adjoins to TP, and the object every student to VP. The MBR is satisfied, since both variables $t_1$ and $t_2$ are bound by their most local potential A'-binder (by the QNPs with which they are co-indexed, and which are in A'-positions). In (6b), only the object every student undergoes QR; the subject a professor remains in Spec, TP in accordance with the Optionality of QR principle. The MBR is again satisfied: every student is the closest potential A’-binder for the variable $t_1$.

On the other hand, object QNPs in English lose scope ambiguity when they interact with negation, as in (7b), although the scope ambiguity of subject quantifiers still holds, as in (7a)\(^3\).

(7)  
\begin{align*}
\text{a. Every student didn’t read the book.} \\
\quad \text{i) No student read the book (every>neg)} \\
\quad \forall(x) \lnot [\text{student}(x) \rightarrow \text{read} \text{the book}(x)] \\
\quad \text{ii) Not every student read the book (neg>every)} \\
\quad \lnot \forall(x) [\text{student}(x) \rightarrow \text{read the book}(x)] \\
\text{b. John didn’t read every book.} \\
\quad \lnot \forall(x) [\text{book}(x) \rightarrow \text{John read}(x)] \ (\text{neg>every})
\end{align*}

\(^{3}\) A & L (1993a) also observe that the direct object quantifier cannot take wide scope over the subject quantifier in a negative sentence like the example (i). The unavailability of the wide scope reading of the object quantifier indicates that negation has a blocking effect on QR. 
(i) Someone does not like everyone (some>every, *every>some)
The subject quantifier *every student* in (7a) shifts to Spec, TP via EPP driven movement and adjoins to TP via QR, as in (8), which derives the wide scope reading of the subject quantifier. The inverse scope reading is generated via reconstruction of the subject to the VP internal t₁ position at LF (Kitahara 1992; Hornstein 1995).4

(8) LF representation

\[
\text{reconstruction}
\]

The rigid narrow scope of the object quantifier with respect to negation, on the other hand, is derived by local QR, adjoining to VP; namely the object quantifier *every book* cannot move across NegP, as represented in (9a), since NegP blocks the object quantifier raising. However, A-movements such as subject raising to Spec, TP are not blocked by NegP as *John* moves across NegP in (9b). I will not discuss this asymmetry between A-movement and A’-movement any further because it is beyond the scope of this paper (but see Rizzi 1990 and Rizzi 1992 for more).

4 Chomsky (1995) (cited by Lasnik (1999a, p192)) argues against scope reconstruction of subject QNPs: “.. the impossibility of eliminating an A-trace makes it plausible that reconstruction should be barred in A-chains” He rather assumes Quantifier Lowering (QL) for the negation wide scope reading by suggesting that “the lowered reading could result from adjunction of the matrix quantifier to the lower IP(c-commanding the trace of raising and yielding a well-formed structure if the trace of quantifier lowering is deleted, along the lines of May’s original proposal). But reconstruction in the A-chain does not take place, so it appears.”(p.327)

However, QL has not been accepted as a satisfactory answer. It has been argued against by many researchers including Zubizarreta (1982) and Hornstein (1995). Alternatively, negation raising serves a plausible account for the negation wide scope reading with subject QNPs. However, scope interaction of object QNPs and negation is hardly accounted for under negation raising hypothesis. The negation blocking effect which is in effect in LF movement should disappear if negation raises.

Alternatively, derivational QR application may explain the scope ambiguity of subject QNPs as in (i)(following Dan Finer’s suggestion).

(i) \[
\text{reconstruction}
\]

The VP-internal subject undergoes QR, adjoining to VP before EPP movement and it moves to Spec,TP. Then, it again undergoes QR, adjoining to TP. Subject *every student* can be read both in a wide scope and in a narrow scope via serial movements.

Despite the existence of controversial claims over scope reconstruction of subject QNPs and of several alternative approaches, I adopt scope reconstruction of subject QNPs hypothesis for the sake of simpler account for children’s developmental patterns in the current study. I will leave this issue for future study for the moment. Thank John Bailyn for drawing my attention to this issue.
(9) LF representation
   a. *[[TP every book] [TP John did [negP not [VP t read t]]]]
   b. [TP John did [negP not [VP every book] [VP t read t]]]

The negation blocking effect follows from the Negation Induced Barrier (NIB), which was originally proposed by Beck (1996) to account for the intervention effect of negation in LF \(wh\)-movement; an intervening negation blocks LF movement. The node dominating negation becomes a NIB and movement over a NIB is banned since it violates the Minimal Negative Structure Constraint as schematized in (12). The relevant definitions are as follows:

(10) Negation Induced Barrier (NIB) (Beck 1996: 15)
    The first node that dominates negation, its restriction, and its nuclear scope is a Negation-Induced Barrier.

(11) Minimal Negative Structure Constraint (MNSC) (Beck 1996: 15)
    If an LF trace \(\beta\) is dominated by a NIB \(\alpha\), then the binder of \(\beta\) must also be dominated by \(\alpha\).

(12) [Diagram showing NIB and MNSC]

This is how the MNSC works for (7b): the movement of the object quantifier \textit{every book} to a TP-adjoined position as in (9a) is not legitimate under the MNSC since the binder, \textit{every book} adjoining to TP, is not dominated by NegP even though the trace of the raised object quantifier is dominated by NegP. Thus, (9a) violates the MNSC. As a result, the object quantifier cannot scope over negation since the object quantifier must not be raised
over NegP. The correct LF representation for (7b), then, should be like (9b), where the object quantifier raises locally to a VP-adjoined position, satisfying the MNSC.

In sum, subject QNPs in a negative sentence can have two readings due to scope reconstruction; a surface scope reading (every>neg) which follows the surface structure and an inverse scope reading (neg>every) which is derived by scope reconstruction of subject QNPs. However, object QNPs can only have one reading in a negative sentence due to local QR because the MNSC blocks the movement of object QNPs over negation (NIB).

3. Scope Interaction of QNPs and Negation in Korean

Argument quantifiers exhibit frozen scope in Korean, which contrasts with scope ambiguity in English (recall example (1)): namely, there is only one reading, which the subject quantifier nwukwuna ‘someone’ scopes over the quantified object motun salam ‘every person’ in (13). This example is from Han et al (2006, 19).

(13) Nwukwunka-ka motun salam-ul piphanhay-ss-ta
Someone-Nom every person-Acc criticize
‘Someone criticized every person’ (some>every)
*’Everyone was criticized [maybe by different people]’ (*every>some)

I assume that subjects are base-generated in Spec, VP and do not move but stay in Spec, VP in Korean, based on data of ECM constructions and multiple nominative constructions (for relevant discussion, see Koopman and Sportiche 1991, Lee 1990, J. Yoon 1990 and Beck and Kim 1997). The unavailability of subject raising in Korean induces the lack of an object-wide scope reading, as shown in (14).

(14) LF Representations:
   a. [TP [VP1 nwukwunka-ka1 [VP1 t1 [VP2 motun salam-ul2 [ VP2 t2 piphanhay-ss-ta]]]]]
b. *[TP [VP1 motun salam-ul2 [VP1 nwukwunka-ka1 [VP1 t1 [VP2 t2 piphanhay-ss-ta]]]]]

The LF representation (14b), which would generate the inverse scope relation where the object c-commands the subject, is ruled out by the Minimal Binding Requirement (A & L 1993). In (14b), both subject and object are in theta-positions and they must undergo QR by the *Optionality of QR* principle (A & L 1993), which requires a QNP in a thematic position to undergo QR obligatorily. The most local A’ binder for both variables is the subject and the subject is co-indexed with its own variable, so the object variable t₂ cannot be bound by it most local potential A’-binder. Thus, the representation fails.

Before moving to the interaction of quantifier scope and negation, Korean negation needs to be discussed. There are two types of negation in Korean, as shown in (15).

(15)  

a. Chelswu-ka ppang-ul an mek-ess-ta “Short-form negation”
    C-Nom bread-Acc NEG eat-PST-Decl
    ‘Chelswu did not eat the bread’

    C-Nom bread-Acc eat-ci NEG-PST-Decl
    ‘Chelswu did not eat the bread’

Following previous work (Hagstrom 1997; Sells 2001), I categorize them as short form negation and long form negation respectively. In short form negation (SFN, 15a) the negative adverb *an* precedes the verb whereas in long form negation (LFN, 15b) the negative verb *anh-ta* takes a content verb as its complement (Sells 2001). In terms of syntactic structure of Korean negation, I follow Sells (2001) in claiming that SFN adjoins to V₀ directly, as in (16), while LFN can adjoin to either V₀ or VP as in (17). In this analysis, there is no functional projection NegP (for more argument, see Sells 2001).
SFN is a sister of the verb that it negates and therefore cannot c-command out of the immediately containing $V^0$, while LFN is itself a verb which takes a verbal complement, which c-commands arbitrarily large part of the structure. This syntactic property of negation is well demonstrated in the construction with the adverb *yekan* as illustrated in (18). The adverb *yekan* literally means ‘commonly’, but must be used with a negative, resulting in meaning ‘uncommonly’ in a positive sense\(^5\) (Sells 2001; Cho 2001).

(18) a.  yekan coh-ci anh-ta  
    commonly good-ci Neg-Decl  
    ‘is uncommonly good’

b.  *yekan an coh-ta  
    commonly Neg good-Decl

*yekan* in LFN is licensed since it is c-commanded by the negative verb *anh* as shown in (19a), but *yekan* in SFN is unlicensed because it is not c-commanded due to the low position of negation in SFN as in (19b), so the derivation crashes.

\(^5\) The adverb *yekan*, which is a so called ‘negative sensitive’, must be different from other NPIs such as *amwuto* ‘anybody’, because NPIs like *amwuto* can be licensed by SFN as well as by LFN. This fact about NPIs licensing has motivated analysis such as negation cliticized V-raising to T/C (Choi 1999). Whether the verb raises to C or not, the scope of negation with QNPs does not change, since I assume that the scope of QNPs and negation is determined by the base position of negation. *yekan* should also be licensed in its base-generated position. As a result, *yekan* in SFN cannot be licensed by negation, because it is not c-commanded by negation at this point. For more arguments, see Sells (2001).
The distinct structures hypothesis for SFN and LFN is also supported by different scope effects in coordination. Neg adjoined to the second verb in SFN (20a) cannot take scope over the first clause, VP₁, while the scope of negation in LFN (20b) is ambiguous since negation can take scope over both clauses or take scope over only the second clause, VP₂ (Yoon 1990).

(19)  
   a.  VP : LFN
       VP   V
            |  
            an  coh-ci
   b.  *VP : SFN
       Adv  VP
            |  
            yekan  coh-ci

   Neg  V
        an  coh-ta

On the other hand, Hagstrom (1997) argues that both LFN and SFN involve a functional projection, NegP, for negation and that SFN and LFN are not fundamentally different. He argues that negative morpheme an found in SFN as well as LFN is the specifier of NegP. However, based on the distinct scope judgments between SFN and
LFN, that is, QNPs in SFN always take wider scope than negation while, in LFN, either negation or QNPs can scope over the other, he proposes that the hierarchical position of NegP is different in SFN and in LFN, due to the effect of the leftward movement shown in (21). In SFN (21a), the direct object moves leftward over an, while in LFN (21b) the entire verb phrase (VP) moves. Thus, the negation type effect is generated by the different position of NegP in SFN and in LFN.

(21)  

a. Chelswu-ka \[-NegP ppang-ul \[an [VP t i mek Neg]]\] -ess-ta  (SFN)

   C-Nom  bread-Acc Neg  eat  -Pst-Decl

b. \[-NegP [VP Chelswu-ka ppang-ul mek-ci]i [ani [t i Neg]]\] hay-ss-ta  (LFN)

   C-Nom  bread-Acc eat-ci Neg  do-Pst-Decl

‘Chelswu didn’t eat the bread’

However, his framework raises some issues when it comes to account for K-E bilingual children’s strong acceptance of a wide-scope reading of object QNPs with respect to negation in English, which is not possible in adult English, and which I will argue is attributable to the cross-linguistic influence of Korean (see section 5 for details). In order to account for this, his framework would have to appeal to LF object raising such as covert scrambling of object QNPs, which seems to violate the MNSC assuming that the MNSC is in effect for all LF movements such as covert scrambling and QR. In addition, covert scrambling has not been well attested in Korean. Thus, such an approach is not desirable. Concerning the interlanguage grammar of English negation in K-E bilingual children, which will be discussed in section 5, Sells’ (2001) analysis for Korean negation handles the transfer of the Korean negation structure to English negation in K-E bilingual children much more straightforwardly without the need to appeal to some unattested covert movement, or violate the MNSC. Therefore, I assume that the phrase structure of negation in Korean is as follows:
Depending on negation type, the scope interpretation of quantifiers can vary. The scope of negation in LFN is interpreted with more flexibility and this is due to LFN being able to be sister to either $V^0$ or VP. As a result, the scope of universal quantifiers such as *motun* ‘every’ becomes ambiguous in LFN, as in (23).

(23) Chelswu-ka motun chayk-ul ilk-ci anh-ass-ta :LFN
C-Nom every book-Acc read-ci NEG PST-Decl
‘Chelswu didn’t read every book’
i) Chelswu read none (every>neg)
ii) Chelswu read some books, but not every book (neg>every)
It is widely agreed that there is ambiguity in LFN regardless of the position of quantifiers but no ambiguity in SFN (J-H Suh 1989; Hagstrom 1997). However, while most authors agree to the narrow scope reading of negation in both SFN and LFN with respect to subject QNPs and object QNPs, some researchers report conflicting judgments on the wide scope reading of negation (Han et al 2006). The conflicting judgments among researchers are summarized in (24).

(24) Hagstrom (1997): Negation type effect
SFN: every in subject/object > neg, * neg> every in subject/object
LFN: every in subject/object > neg, neg> every in subject/object

J-H Suh (1989): Negation type effect and positional effect
SFN: every in subject/object > neg, * neg> every in subject/object
LFN: every in subject/object > neg,
* neg> every in subject, neg> every in object

Han et al (2006): Positional effect
SFN/LFN: every in subject > neg, * neg> every in subject
every in object > neg, neg> every in object

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6 Han et al. (2006) propose that the contradicting scope judgments are from the random choice between a verb-raising grammar and an INFL-lowering grammar by speakers of SOV languages, due to the lack of positive evidence for setting the verb-raising parameter. Under their hypothesis, the population acquiring a verb-raising grammar will allow the narrow scope reading of QNPs as the verb and negation which is cliticized to the verb raise. In contrast, the population who acquire an INFL-lowering grammar will allow the wide scope reading of quantifiers, as the verb remains in situ. Since neg-cliticization and V-raising to T derive the narrow scope of quantifiers with respect to negation, the relative scope of negation and quantifier will serve as a diagnostic to tell us whether the verb has raised to T or not. The narrow scope reading of negation (every>neg) indicates no verb-raising or INFL-lowering grammar, whereas the wide scope (neg>every) reading of negation indicates verb-raising.

However, they should, then, assume that there will be no scope ambiguity of negation and quantifiers within the population having either grammar. In reality, though, the scope ambiguity within individual speakers exists. V-raising should be optionally triggered for the sake of the scope ambiguity if it is true that the existence of V-raising plays a crucial role in determining the scope relations. In addition, it is widely accepted that the scope of subject/object QNPs is ambiguous in LFN, but not in SFN. Both grammars cannot predict the negation type effect.

By assuming the negation structure as in (22), optional verb raising is not crucial in terms of scope interaction of QNPs and negation, so I leave it open for future study.

7 The symbol “*” stands for an unavailable reading.
Y-K Baek (1998); Y-S Choi (1999): Neither positional effect nor negation type effect

SFN/LFN: *every* in subject/object > neg, neg> *every* in subject/object

Despite existence of conflicting scope judgments among native speakers/researchers, in this paper I follow the judgments shown in (25), which are generally accepted in the literature (Cho 1994; Park 1994; Sohn 1995; Cho 1975: cited by Hagstrom 1997).

(25)  

**SFN**

a.  **Motun haksayng-i ku chayk-ul an ilk-ess- ta** (every> neg, *neg>every)
    every student-Nom the book-Acc Neg read-PST-Decl
    ‘Every student did not read the book’

b.  Chelswu-ka **motun chayk-ul an ilk-ess-ta** (every>neg, *neg>every)
    C-Nom every book-Acc NEG read-PST-Decl
    ‘Chelswu did not read every book’

**LFN**

c.  **Motun haksayng-i ku chayk-ul ilk-ci anh-ass ta** (every> neg, neg>every)
    every student-Nom the book-Acc read-ci Neg-PST-Decl
    ‘Every student did not read the book’

d.  Chelswu-ka **motun chayk-ul ilk-ci anh-ass-ta** (every>neg, neg>every)
    C-Nom every book-Acc read-ci NEG PST-Decl
    ‘Chelswu did not read every book’

QNPs in SFN (25a, 25b) only have in a wide scope reading (every>neg, *neg>every) while QNPs in LFN (25c, 25d) are ambiguous between the narrow scope reading (neg>every) and the wide scope reading (every>neg) regardless of grammatical position of QNPs. LF representations in SFN and in LFN are suggested as follows:

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8 The scope judgments in (25) have also been confirmed by consultation with other native speakers and follow the author’s intuitions.
The scope relation of QNPs and negation in S-structure does not change at LF, although subject QNPs and object QNPs undergo obligatory QR to the relevant adjunction positions. Both subject and object QNPs c-command negation in SFN (26a), so they take wide scope over negation. In LFN, the scope of QNPs is determined by the position of negation. If negation adjoins to VP₁, QNPs cannot raise over negation because VP₁, which dominates negation, becomes an NIB and blocks the LF movement. Consequently, negation takes scope over subject QNPs and object QNPs. In the case where negation adjoins to V, the scope interpretation is the same as in SFN.
In this section, I have shown the differences between Korean and English negation. English negation projects its own projection, NegP, whereas Korean negation adjoins to $V^0$ or VP. Korean negation is more complicated with SFN and LFN than English negation in its formation. The scope interaction of QNPs and Korean negation is realized differently depending on the negation type. The scope interaction of QNPs and negation in Korean and English is summarized in (27).

(27) Scope interaction of QNPs and negation in English vs. in Korean

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<tr>
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<th>English</th>
<th>Korean</th>
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<tr>
<td></td>
<td>SFN</td>
<td>LFN</td>
</tr>
<tr>
<td>Subject</td>
<td>every&gt;neg,</td>
<td>every&gt;neg,</td>
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<tr>
<td></td>
<td>neg&gt;every</td>
<td>neg&gt;every</td>
</tr>
<tr>
<td>Object</td>
<td>neg&gt;every</td>
<td>every&gt;neg,</td>
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<td></td>
<td>neg&gt;every</td>
<td>neg&gt;every</td>
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</table>

Bilingual acquisition of the distinct negation system of each language (English vs. Korean) may be difficult for Korean-English bilingual children because they are exposed to two different competing structures. Following the cross-linguistic hypothesis, the developmental patterns of K-E bilingual children should not be the same as those in monolingual children, assuming that there will be transfer of a negation system into one language from the other. We might also predict that the acquisition of a negation system of one language could be delayed due to interference from the grammar of the other language. A natural question that arises is: “what direction will transfer occur; from Korean to English or from English to Korean?” In the following section, the previous studies of monolingual children acquisition of QNPs and negation scope interaction will be reviewed in order to compare the patterns of English and Korean monolingual children with those of K-E bilingual children.

4. **Previous Studies:**

**Monolingual Children’s Acquisition of Quantifier-Negation Interaction**

Recent studies (Philip 1995; Musolino 1998; Kim et al 2003) have observed isomorphism in monolingual children’s acquisition of scope interpretation of universal
quantifiers, that is, children tend to follow the linear order from left to right of QNPs and negation in scope interpretation. For instance, English monolingual children prefer the every>neg reading for subject QNPs and the neg>every reading for object QNPs. Based on experimental studies using the Truth Value Judgment Task (TVJT), Musolino (1998) studied 4 to 7-year-old English monolingual children. He tested sentences containing QNPs and negation as in (28).

(28)  a. Mickey Mouse didn’t buy every orange
     b. Every horse didn’t jump over the fence

He found that English-speaking children show a strong preference for isomorphic readings, which follow the linear order of QNPs and negation on the surface form. In the case of object QNPs, they had no difficulty accessing the negation wide scope reading (not>every) of the sentences like (28a), which follows the linear order of negation and QNPs, as 18 out of 20 English speaking children accepted the negation wide scope reading (not>every) 85% of the time, which is consistent with the relevant adult interpretation. On the other hand, 18 out of 20 English speaking children rejected the negation wide scope reading (not>every) 92.5% of the time with subject quantifiers for test statements such as (28b), whose not>every reading is possible in adult English. This contrasts with the fact that adults accepted it 100% of the time. Thus, they conclude that there are systematic differences in the way that children and adults interpret sentences containing the universal quantifier and negation; English-speaking children are initially restricted to isomorphic interpretations in sentences where both isomorphic and non-isomorphic readings are available in adult grammar.

I propose that English-speaking children’s isomorphic interpretation for sentences like (28b) should be a response to a grammar that does not have reconstruction of subject QNPs to the trace of the VP internal position as in (29b), which leaves them with only the surface scope reading.
Therefore, English speaking children’s LF representations for the sentences (28a) and (28b) are proposed as (29). Due to the constraint MNSC, the object QNP in (29a) does not raise across NegP, but rather adjoins to VP at LF. It takes narrow scope below negation. Furthermore, in children English grammar, it is not plausible for object QNPs to undergo QR across negation under Musolino’s children isomorphism hypothesis as it reverses the linear scope of QNPs and negation. In addition, it violates the MNSC.

Kim et al. (2003) investigate monolingual Korean speaking children’s acquisition of scope interaction of object quantifiers and negation in Korean by using the same methodology (TVJT) used in Musolino (1998)’s study. They examined whether the scope ambiguities in sentences with object quantifiers and long form negation and the lack of scope ambiguities in sentences with object quantifiers and short form negation in Korean could be experimentally confirmed by testing 4-year-old children of Korean. They found that the isomorphic reading (every>neg) in the interaction between object QNPs and negation is preferred by the children regardless of negation type since object QNPs precedes negation in both SFN and LFN in terms of word order: with short form negation, children accepted the puppet’s statements about 82% of the time in the case of every>neg, but the children accepted the puppet’s statements only 36.7% of the time in the case of neg>every; with long form negation, children accepted the puppet’s statements about 87% of the time in the case of every>neg but only 40% of the time in the case of neg>every.

However, the narrow scope with object quantifiers in LFN should be available in adult-like grammar, which was confirmed by 76.7% acceptance by adult subjects. Kim et al. suppose that children’s lower acceptance (40%) of the narrow scope versus higher acceptance (76.6%) by adults show children’s isomorphism. They conclude Korean-speaking children are also restricted to the isomorphic reading (every>not), which
follows the linear order of QNPs and negation, in scope interaction of object quantifiers and long form negation.

Scrutiny of the results raises a question about whether isomorphism is general for Korean monolingual children. Remember that English monolingual children’s isomorphic interpretation was very clearly observed since only 2 out of 20 children accepted the inverse scope reading while 18 children rejected it (Musolino 1998). However, Korean monolingual children’s acceptance (40%) is relatively high in comparison to English children’s (10%) (Kim et al. 2003). Although the authors concluded that Korean speaking children are initially restricted to an isomorphic reading with the results (children accepted the “every>neg” condition 87% of the time but the “neg>every” condition only with LFN 40% of the time), the acceptance rate 40% is still too high to be neglected. Since they studied 60 children, about 24 children accepted the “neg>every” condition with LFN, which is available in adult grammar. These 24 children were not restricted to an isomorphic reading. Therefore, isomorphism might not be general for Korean monolingual children but simply one of variant patterns.

Furthermore, their study found that their subject children did not show significant scope difference between SFN and LFN (p=.86). They report that children accepted the “neg>every” condition 36.7% of the time with SFN and 40% of the time with LFN. This is very unlike adults’ judgments which show a significant difference between the two types of negation (p=.008): Korean adults accepted the “neg>every” condition with SFN 33.3% and with LFN 76.7% of the time as shown in Figure 1.
Therefore, I conclude that the Korean speaking children had not acquired the adult–like grammar of negation yet, whose syntactic structure I argue is different depending on negation types, SFN or LFN. I assume that they fail to differentiate the scope judgment by negation type due to their incomplete acquisition of negation type. I hypothesize that monolingual Korean children are initially restricted to the isomorphic reading (every>neg) because they analyze all negation as adjunction to V\(^0\), since negation can adjoin to V\(^0\) both in SFN and in LFN. Once they acquire the flexible syntactic position of LFN (VP in addition to V\(^0\) in LFN), they can derive the inverse scope reading (neg>every) by adjoining negation to VP, as 40% of the children did. Furthermore, it is plausible that they overgeneralize the flexible position of negation to SFN at LF. 36.7% of the monolingual Korean children who accept both readings (every>neg, neg>every) with SFN demonstrate that they overgeneralize the negation property of LFN to SFN and acquisition of the target-grammar of Korean negation has not yet been completed. Children may overcome overgeneralization errors once they are exposed to data such as the yekan structure, which reveals the syntactic difference between SFN and LFN.

To summarize, English monolingual children allowed the surface scope reading, which follows the linear order of QNPs and negation on the surface, and reject the inverse scope reading. Although most Korean monolingual children also rejected the inverse scope reading, there are some children (about 40%) who could access the inverse scope reading as well as the surface scope reading both in SFN and in LFN. The different
developmental patterns of the Korean monolingual from those of the English monolingual are attributable to the distinct negation system of Korean. Some Korean monolingual children access even the non-target inverse scope reading, which is due to incomplete acquisition of the distinct negation system by negation type, SFN and LFN. The patterns of the English monolingual and the Korean monolingual are summarized in the following table.

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>Korean (SFN)</th>
<th>Korean (LFN)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M.Children</td>
<td>Adult</td>
<td>M.Children</td>
</tr>
<tr>
<td>Subject</td>
<td>every&gt;neg</td>
<td>every&gt;neg,</td>
<td>every&gt;neg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>neg&gt;every</td>
<td></td>
</tr>
<tr>
<td>Object</td>
<td>neg&gt;every</td>
<td>neg&gt;every</td>
<td>every&gt;neg,</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>neg&gt;every</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(37%)</td>
</tr>
</tbody>
</table>

* N/A : data is not available currently.

The scope rigidity of subject QNPs (every > neg) in SFN in adult Korean contrasts with the scope ambiguity of subject QNPs in adult English. Even though the judgments on object quantifiers in Korean are controversial (some native speakers interpret them ambiguously in negative sentences both in SFN and in LFN, but object QNPs are widely accepted only in a wide scope with respect to SFN), neither the ambiguous scope of object QNPs nor the rigid wide scope of object QNPs accords with the scope of object QNPs in English, since only a narrow scope within negation is available for object QNPs in English. This is because the hierarchical position of negation is different in English and in Korean SFN: NegP is higher than VP in English while negation adjoins to V in Korean SFN, which is lower than subject and object QNPs. Thus, it seems that SFN provides a good ground to test the cross-linguistic influence of English negation structure on interpretation of scope of QNPs and Korean negation.

Under the UG constrained language acquisition hypothesis that bilingual language acquisition is guided by UG just as monolingual acquisition is, I predict that Korean-English bilingual children will show consistent patterns of monolingual children: (i) They will accept only a wide scope reading for subject QNPs in English and only a narrow
scope reading for object QNPs in English (ii) In Korean, in general, they will allow a wide scope reading for subject/object QNPs in SFN, but it is still possible that they might allow a narrow scope reading for subject/object QNPs following the patterns of the minority of Korean monolingual children. On the other hand, following the cross-linguistic influence hypothesis, I predict that they will show different patterns from those of monolingual children by transferring the distinct negation structure of one language to the other. In the case of that English is dominant for the K-E bilingual, the English negation structure will be transferred to Korean negation and they will show more acceptance of the negation wide scope in object QNPs in Korean. In the case of that Korean is dominant, the transfer of Korean negation structure to English structure is expected. They will accept the wide scope reading of object QNPs over negation since Korean grammar allows the wide scope reading of subject/object QNPs over negation in SFN and in LFN without exception, although it is not possible in English.

5. Acquisition of Quantifier-Negation Scope Interaction in Bilingual Children

In the previous section, I discussed that English monolingual children’s acquisition of the scope interaction of QNPs and negation starts from isomorphic interpretation. Concerning Korean-English bilingual children’s acquisition of semantic knowledge, an interesting question that arises is how they interpret scope of QNPs with respect to negation since scope interpretation of universal QNPs with negation differs in both adult language and child language.

Recall that in adult Korean, every in subject position and in object position takes only a wide scope outside negation in SFN, while every in LFN allows both a wide scope reading and a narrow scope reading. The examples in (25) are repeated in (31).

(31) SFN
a. Motun haksayng-i ku chayk-ul an ilk-ess-ta (every> neg, *neg>every)  
   every student-Nom the book-Acc Neg read-PST-Decl  
   ‘Every student did not read the book’

b. Chelswu-ka motun chayk-ul an ilk-ess-ta (every>neg, *neg>every)
C-Nom every book-Acc NEG read-PST-Decl
‘Chelswu did not read every book’

LFN

c. Motun haksayng-i ku chayk-ul ilk-ci anh-ass ta (every> neg, neg>every)
every student-Nom the book-Acc read-ci Neg-PST-Decl
‘Every student did not read the book’
d. Chelswu-ka motun chayk-ul ilk-ci anh-ass-ta (every>neg, neg>every)
C-Nom every book-Acc read-ci NEG PST-Decl
‘Chelswu did not read every book’

However, most Korean monolingual children fail to differentiate LFN from SFN in terms of the scope interaction of QNPs and negation by rejecting the negation wide scope reading not only in SFN (32a,ii) but also in LFN (32b,ii).

(32) Korean monolingual children’s interpretation

a. Miki-ka motun orenci-lul an sa-ss-ta (SFN)
Miki-nom every orange-acc neg buy-pst-decl
‘Mickey didn’t buy every orange’
   i) every>neg (√ in adult Korean): accepted by 82%
   ii) neg>every (* in adult Korean): accepted by 36.7%
b. Miki-ka motun orenci-lul sa-ci-anh-ass-ta (LFN)
Miki-nom every orange-acc buy-ci neg-pst-decl
‘Mickey didn’t buy every orange’
   i) every> neg (√ in adult Korean) : accepted by 87%
   ii) neg>every (√ in adult Korean) : accepted by 40%

Likewise, English monolingual children have a strong preference for the isomorphic reading of subject QNPs, namely they access only the wide scope reading of

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9 The symbol ‘√’ stands for possible reading in adult Korean while ‘∗’ means impossible reading (or not widely accepted reading) in adult Korean.
subject QNPs, as shown in (33a), although every in subject position exhibits scope ambiguity with respect to negation in adult English.

(33)  English monolingual children’s interpretation
   a. Every horse didn’t jump over the fence (∀ > neg, *neg>∀ (√ in adult English))
   b. Mickey didn’t buy every orange (*∀>neg, neg>∀)

Thus, the current study examines the following questions: (i) Do K-E bilingual children show same developmental patterns as those of monolingual children?; (ii) If not, how are their patterns different from monolingual children’s?; (iii) Is there cross –linguistic influence in their acquisition of scope interaction of QNPs and negation?

Under the hypothesis of UG constrained acquisition, we predict that bilingual children will follow the monolingual children’s patterns, such as isomorphism. Nevertheless, it is possible that they will show the scope ambiguity as in the adult-like grammar of each language, instantiating accelerated development in bilingual acquisition due to cross-linguistic influence. Under the cross-linguistic influence hypothesis, which proposes that facilitation/acceleration, delay, or transfer could emerge in bilingual language acquisition (Paradis and Genesee, 1995; Genesee and Paradis, 1997), transfer will be expected as the incorporation of the negation structure of one language into the other (eg. from Korean to English). Furthermore, it is also possible that the burden of acquiring the two distinct negation systems of English and Korean could slow down the acquisition process of negation in bilingual children, causing them to be behind monolingual children in their overall progress in grammatical development. In contrast, interdependent development with cross-linguistic influence could accelerate a certain pattern, such as access to the inverse scope reading in K-E bilingual children. Acceleration means that a certain property emerges in the grammar earlier than would be the norm in monolingual acquisition.

Most previous studies of bilingual acquisition (Paradis and Genesee, 1995; Genesee and Paradis, 1996; Hulk, 1997) have been done with children who were brought up bilingually from birth by their parents speaking different native languages to them, following the strategy of “one person-one language”. However, Korean-English bilingual
children in the present study are non-infant bilinguals with parents speaking one language, Korean. They learned Korean first and started to speak English later when they attended a day-care center where English is mainly spoken between the ages of 2 and 4. The reason that I do not identify them as child second language learners (child L2ers) is because they were first exposed to English earlier than the age of 4 and spoke both languages fluently at the time of testing. The boundary at 4 is set because it is generally assumed that most of the child’s first language (L1) is in place at this age. Thus, in terms of directionality of transfer, I predict that Korean will be more likely to influence English because they were exposed to Korean first and longer.

5.1 Experimental Investigations

The experiment was designed as a partial replication of Musolino’s (1998) work on English L1 acquisition of quantifier-negation interaction. The experiment is based on the Truth Value Judgment Task (TVJT) (Crain and Thornton 1998). The experimenter plays audio-taped short stories with pictures to the participants. At the end of the story, a puppet makes a statement about what he thinks happened in the story. The participant’s task is to determine whether the puppet told the truth or not. The story is given after instructions and a warm-up story. The test sentences are presented after one or two control sentences. The control sentences are designed to control for potential problems with attention or mastery of the experimental task (e.g. the yes-response bias). The experiment consists of 4 short scenarios in English and 4 short scenarios in Korean designed to test children’s scope interpretation of QNPs and negation. We begin our investigation by testing children’s interpretation of every, first in the object position then in subject position.

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10 A child L2 learner is defined as an L2er who was first exposed to the L2 between the ages of 4 and 7 years (Unsworth 2004). Subjects in this study are 4 to 7 year-olds and they were first exposed to English at the age of 0 to 4. Some children, who began to expose to English at the age of 3 or 4, might be in the border between the bilingual and child L2 learners. However, I include them to the bilingual children following a broader definition of bilingual children.

11 However, it was revised a little: for example, I used a story telling method in a way of providing the context instead of using a puppet show with props which Musolino used but based on the same scenarios for the sake of comparison with his results.
The current experiments are designed: i) to investigate Korean-English bilingual children’s comprehension of scope interaction involving universal quantifiers and negation; ii) to examine whether bilingual children’s scope interpretation of QNPs and negation differs from monolingual children’s; iii) to investigate whether cross-linguistic influence involves in bilingual children’s language acquisition.

5.1.2 Participants

15 Korean-English speaking children between the ages of 5;0 to 7;6 (mean 6;0)\(^{12}\), who all live in long island, NY, were tested. The age at the time of first exposure to English ranges between 5 months and 4;0 (mean 3;0) years and the length of stay in the U.S.A. between 1;9 and 6;7 (mean 4;6). 6 children were born in the U.S.A. and they were all first exposed to English since they were born. They speak both Korean and English but English is dominant in their daily life at the time of testing. As for other 9 children who were not born in the U.S.A., most of them moved to the U.S.A. and were exposed to English before the age of 3. They are fluent both in English and in Korean at the time of testing. Thus, I conclude that they also can be considered Korean-English bilinguals. Prospective participants were interviewed in English and in Korean in order to test comprehension of short stories of English and Korean. The 15 children above all passed the test and were regarded as fit for the judgment task.

5.1.3 Experimental Design

The experiments are designed to test 2 factors with two levels each: scope difference (neg>∀ vs. ∀>neg) and grammatical position of universal QNPs (subject vs. object). The experiment was thus divided into 4 different conditions, each condition

\(^{12}\) Musolino(1998) studied 4 to 7 year-old (means 5;11) English speaking children in acquisition of scope of QNPs and negation and Kim et al. (2003) studied 4-year-old Korean speaking children in acquisition of the scope interaction by negation type (SFN and LFN). Previous studies (Choi & Zubin 1985; Han & Park 1995; Kim 1997) report that Korean speaking children begin to use SFN around the age 1;7 but LFN around age 3;5. Therefore, I assume the K-E bilingual children at the ages of 5 to 7 are old enough to comprehend and produce SFN and LFN in Korean as well as English negation.
testing for the neg>∀ or the ∀>neg reading in sentences containing a subject QNP or an object QNP. 15 subjects were tested for each condition. The design is summarized in (34).

(34) Design of experiment
2x2 design Scope x Grammatical position
(neg>∀ vs. ∀>neg) (subject vs. object)

<table>
<thead>
<tr>
<th>Scope</th>
<th>Subject QNP</th>
<th>Object QNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>∀&gt;neg</td>
<td>N=15</td>
<td>N=15</td>
</tr>
<tr>
<td>neg&gt;∀</td>
<td>N=15</td>
<td>N=15</td>
</tr>
</tbody>
</table>

5.1.4 Materials

The experiments were separated into two sessions: one was to test Korean and the other was to test English. Eight stories were constructed; four stories in English and four stories in Korean. The Korean stories and the English stories are not identical lest subjects should depend on the stories they heard in the previous session. There are four different test sentences by condition; i) subject QNP and the ∀>neg reading, ii) subject QNP and the neg>∀ reading, iii) object QNP and the ∀>neg reading, iv) object QNP and the neg>∀ reading as in (35).

(35) English Test

Subject QNPs:
a. Everybody didn't play in the sandbox. (given in ∀ > Neg context)
b. Every horse didn’t jump over the fence. (given in Neg>∀ context)

Object QNPs:
c. Minnie Mouse didn't eat every muffin. (given in ∀ > Neg context)
d. Mickey Mouse didn't buy every orange. (given in Neg>∀ context)
In the experiments on Korean, all test trials are constructed based on short form negation (SFN) as in (36).

(36) Korean Test

**Subject QNPs:**

a. **Motun** kangaci-ka phwul-ul **an** mek-ess-ta (given in \( \forall > \text{Neg context} \))
   
   Every puppy-nom grass-acc neg eat-pst-decl
   
   ‘Every puppy didn’t eat grass.’

b. **Motwu**-ka khokkili-lul **an** manci-ess-ta (given in Neg> \( \forall \) context)
   
   Everybody-nom elephant-acc neg touch-pst-decl
   
   ‘Everybody couldn’t touch the elephant.’

**Object QNPs:**

c. Twulli-ka **motun** phica-lul **an** mek-ess-ta (given in \( \forall > \text{Neg context} \))
   
   Dooly-nom every pizza-acc neg eat-pst-decl
   
   ‘Dooly didn’t eat every pizza’

d. Twulli-ka **motun** catongcha-lul **an** takk-ass-ta (given in Neg> \( \forall \) context)
   
   Dooly-nom every car-acc neg clean-pst-decl
   
   ‘Dooly didn’t clean every car.’

The statements made by a puppet in four conditions are given in the appendix. Filler items are included in the experiments for the purpose of controlling for participants’ knowledge of the meaning of negation and universal quantifiers as well as comprehension of the stories. The filler statements made by the puppet are also given in appendix. Furthermore, filler items controlled the ‘Yes-response bias’ which children may have; participants might think that the only possible answer in the experiment is ‘true’. Thus, some fillers were designed to give the answer ‘false’.

For instance, a detailed sample story to test how Korean-English bilingual children would interpret a negative sentence with a quantified subject is given in (37) with pictures. In this context, the test statement *Every horse didn’t jump over the fence*

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13 In my previous pilot studies, I found that children tend to respond positively when they did not know the correct answer.
would be true where negation takes scope over the subject QNP (not>every) but false when the subject QNP takes the wide scope over negation (every>not).

(37) Example context for a subject QNP condition:

Three horses are talking about how good they are at jumping and they decide to practice by jumping over a barn and a fence. The horses start galloping towards the barn but as they get closer they realize that it is much too high for them. Therefore, they agree not to jump over the barn. Instead, they try to jump over the fence which looks less tall. The horses line up in front of the fence. One horse goes first and does a great jump over the fence. Another horse follows and also does a nice jump over the fence. However, the third horse hesitates to try to jump because it hurt its leg the other day. The third horse is not sure it is feeling strong enough to jump over that fence. So, this horse ends up not jumping over the fence.

After the story, the experimenter held a puppet acting as if it was listening to the story. The participants were well motivated to help the puppet to understand correctly each story because they were told that the puppet just arrived in this country and understanding English would be difficult for it. The puppet made the following test statements for each condition:
(38)  Test statement: “Hum… that was a great story. I know what happened.

Every horse did not jump over the fence. Am I right?” (Neg>every: √ in adult E)

(39)  Test statement: “I know another thing.

Every horse did not jump over the barn. Am I right?” (every> Neg: √ in adult E)

Here is another sample story for the condition of object QNPs:

(40)  Example context for an object QNP condition:

Mickey Mouse went to the grocery store to buy some fruit. He tried to buy some apples first. He found there were only three apples left. Once he started examining them, he found a big bruise on the first one. He didn't like it. So, he examined the second apple. He found a rotten spot on the second one. Finally, Mickey Mouse examined the third one. It seemed fine at the first look, but he found a worm inside there. At last, he decided not to buy any apples today. Mickey Mouse thought that he might have more luck with oranges. Besides, oranges are healthy and he could make orange juice with them. There were also only three oranges left at the store. Mickey Mouse started examining them. The first orange looked great. It was big, round, and firm. So, he decided to buy it. However, the second orange was too small and the third orange was not very firm. So, he didn't want them. Finally, he bought one orange.
After the story, the test statements (41) and (42) were followed by the puppet.

(41) Test statement:
“I think I understand. **Mickey Mouse did not buy every apple**” (every>neg: * in adult E)

(42) Test statement “Did I understand the story?
**Mickey Mouse did not buy every orange.**” (neg>every: √ in adult E)

The participant is asked to determine whether the puppet’s statement is true or false. If he/she judges the statement to be true, then we can conclude that he/she successfully accesses the conditioned scope reading. If the participant judges the statement to be false, then we conclude that the intended scope reading is not available to him/her.

5.1.5 Procedure

Children were tested individually. Korean-English bilingual children listened to audio taped stories with pictures in English in the first session and in Korean in the second session. They were first introduced to the task with two practice trials, one with the puppet’s statement which was true and the other with the puppet’s statement which was false. Then, they heard four conditioned stories. Three or four pictures for each story were provided to assist subjects to understand each context correctly. In case subjects did not remember the whole story, so they were not able to give answers, they heard the story one more time. In addition, they were asked a confirmation question like “why do think the puppet is right/wrong?”. Their justifying comments confirm the scope relation which their answer was based on.

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14 In the second session, stories in Korean were read by the experimenter, who is a native Korean speaker in order to draw the subjects’ attention better. The experimenter made every effort to give the test sentences with consistent intonation in order to control prosody effect just for the case that prosody influences scope judgment.
5.2 Results from experiments on English

The proportion of ‘yes’ responses to the puppet’s statement for each condition were measured. Subjects’ performance on filler statements was almost perfect, showing that they had knowledge of universal quantifiers and negation and understood the context correctly. The percentage of ‘yes’ responses of test trials are given in Table 1 and Figure 6.

Table 1. Percent Acceptance by Condition in English

<table>
<thead>
<tr>
<th>Grammatical Position(GP)</th>
<th>Scope</th>
<th>K-E bilingual</th>
<th>Adult English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject QP</td>
<td>Neg&gt;∀</td>
<td>80% (12/15)</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>∀ &gt; Neg</td>
<td>100% (15/15)</td>
<td>√</td>
</tr>
<tr>
<td>Object QP</td>
<td>Neg&gt;∀</td>
<td>73.7% (11/15)</td>
<td>√</td>
</tr>
<tr>
<td></td>
<td>∀ &gt; Neg</td>
<td>100% (15/15)</td>
<td>*</td>
</tr>
</tbody>
</table>

Figure 6. Percent Acceptance by Condition in English by the K-E bilingual

12 out of 15 subjects (80%) accepted the quantifier-narrow scope interpretation in a condition of subject QNPs. The narrow scope reading is confirmed by justifying comments such as “because one horse didn’t jump”, given when they were asked a question such as “why do you think so?”. In a condition of a wide scope reading of the subject quantifier, 15 out of 15 children (100%) accepted the statement, which illustrates
they also access a wide scope reading. Thus, their acceptance of both readings implies that they interpret scope of subject quantifiers ambiguously with respect to negation.

As for a condition of object quantifiers, 11 out of 15 children (73.7%) accepted the quantifier-narrow scope reading. In a wide scope context of object quantifiers, 15 out of 15 children (100%) accepted the statement. These results imply that K-E bilingual children also interpret the scope of object QNPs to be ambiguous, which is non-target scope interpretation in English. The results are interesting in comparison to English monolingual children’s patterns because scope ambiguity is not expected under the hypothesis that acquisition patterns by bilingual children would follow monolingual children’s patterns (Figure 7). Monolingual English-speaking children in Musolino (1998)’s study show preference for the isomorphic reading with the result that 18 children (90%) rejected the narrow scope reading of subject QNPs, In other words, only 2 out of 20 children (10%) accepted the narrow scope reading of subject QNPs as presented in Table 2.

Table 2. Acceptance of the narrow scope of QNPs by English monolingual children (Musolino 1998)

<table>
<thead>
<tr>
<th>English</th>
<th>Monolingual Children</th>
<th>Adult English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neg &gt; ∀ of Subject QP</td>
<td>10% (2/20)</td>
<td>√</td>
</tr>
<tr>
<td>Neg &gt; ∀ of Object QP</td>
<td>90% (18/20)</td>
<td>√</td>
</tr>
</tbody>
</table>
On the other hand, K-E bilingual children accepted the wide scope interpretation of object QNPs even though it is not available in English adult grammar. This non-target wide scope reading must not be available to English monolingual children under the isomorphism hypothesis\textsuperscript{15}, which assumes English-speaking children start with isomorphic interpretation following the surface linear order. Then, I presume that this wide scope reading is from Korean influence, considering that a wide scope of QNPs with respect to negation are possible in Korean all the time regardless of their grammatical position. Due to positional flexibility of LFN in Korean, both subject QNPs and object QNPs are judged to be ambiguous in LFN by allowing both readings. The results that K-E bilingual children can successfully access the inverse scope reading instantiate that K-E bilingual children undergo distinct developmental paths from monolingual children regarding scope interpretation of QNPs and negation.

I divide subjects into two groups following the length of stay in the U.S.A. to see whether their performance is correlated to it. Group A (11 children) are children with longer stay, who have stayed in the U.S.A. for more than 4 years (mean 5;4). Group B (4 children) are children with shorter stay, who have stayed in the U.S.A. for 2 years or less (mean 1;11). The individual results by each group are represented in the following table.

\textsuperscript{15}Unfortunately, I could not find studies which test a wide scope of object quantifiers with English monolingual children. Musolino\textsuperscript{1998} did not include this condition in his study. Thus, comparison between monolingual and bilingual is not currently available.
In general, Group A with longer stay accepted a narrow scope reading of QNPs both in subject and in object as well as a wide scope reading. Namely, they gave YES answers to all test trials. Their all positive answers were not from YES-response bias because they gave NO answers to fillers appropriately. Their 100% acceptance of the non-target wide scope reading of object QNPs shows that even Group A with longer stay did not overcome Korean influence, supposing that the wide scope reading should come from scope flexibility of Korean LFN.

On the other hand, 5 children (children 3, 5, 9, 13, and 15) gave NO answers to the test statement, *Everybody did not ride the seesaw*, given in the condition of neg> subject QNPs after Story 2, although it is in the same condition as in Story 1, where they gave YES answers. Story 1 and Story 2 are presented below:
43) Story 1: Three horses

Three horses are talking about how good they are at jumping and they decide to practice by jumping over a barn and a fence. The horses start galloping towards the barn but as they get closer they realize that it is much too high for them. Therefore, they agree not to jump over the barn. Instead, they try to jump over the fence which looks less tall. The horses line up in front of the fence. One horse goes first and does a great jump over the fence. Another horse follows and also does a nice jump over the fence. However, the third horse hesitates to try to jump because it hurt its leg the other day. The third horse is not sure it is feeling strong enough to jump over that fence. So, this horse ends up not jumping over the fence.

Story 2: Pooh and his friends

Pooh, Tiger and Piglet had to stay inside all morning because it was raining. Finally it stopped raining. They decided to go play in the playground. Piglet wants to play in the sandbox. He loves making a sand castle. Unfortunately, it was raining this morning and the sand is all wet and it turned to mud. Piglet says "I might get dirty if I play in the sandbox" "I don't want to get dirty". "I'd rather to ride the swing instead" He decides to ride a swing. He enjoys riding a swing a lot. Pooh and Tiger still don't know what to do. Pooh and Tiger do not feel like riding a swing. So, they approach the slide and the seesaw. The slide is still wet, but the seesaw is dry. Pooh says "We'd better not to ride the slide because there is water on it." Tiger says "But I wanted to ride that slide" Pooh says "Hey Tiger, How about riding the seesaw with me? It would be fun." Tiger says "That sounds fun, let's do it" Pooh and Tiger ride the seesaw together. It is so fun for them to play in the playground.

Story 1 is about three horses jumping over the fence and Story 2 is about Pooh, Tiger and Piglet in the playground. Story 2 closes with Pooh and Tiger who end up riding the seesaw together whereas Story 1 ends with the third horse which did not jump over the fence. Presumably, the children who did not accept the statement Everybody did not ride the seesaw (neg>every) might have focused on the last scene of the story and rejected it because they focused what Pooh and Tiger did at last. Since they accepted the inverse scope reading in Story 1, their rejection of the inverse scope does not necessarily imply their restriction to the surface scope. In case both readings are available to them, they have an option to choose one reading out of the two possible readings. They interpret the subject QNP in a wide scope when they focus the ones (Pooh and Tiger) who did ride the seesaw at the end rather than the one (Piglet) who did not. Thus, I conclude that these children can access the inverse scope reading (neg>every).

Group B (4 children) with shorter stay rejected a narrow scope reading of QNPs both in subject and in object overall. In other words, they accepted only a wide scope
reading of subject QNPs and object QNPs. Their patterns are distinct from those of
English monolingual children even though their rejection of the narrow scope reading of
subject QNPs accords with English monolingual children’s patterns (90% rejection of the
narrow scope reading of subject QNPs). Children in Group B rejected the neg> every
reading in object QNPs condition 100% of the time while it was accepted by 90% of
English monolingual children. It is not expected to reject the negation wide scope reading
if they follow monolingual children’s patterns. In fact, their scope judgments follow from
scope interaction of QNPs and SFN in Korean. Thus, I assume that Korean affects their
scope interpretation and Korean must be the dominant language for Group B although
their speaking English is fluent and their comprehension of English stories is good
enough to be in the test\textsuperscript{16}. Thus, I conclude that Group B’s overall rejection of the
negation wide scope reading results from Korean SFN negation influence.

In sum, neither group of Korean-English bilingual children follows patterns of
English monolingual children as illustrated in Table 4 and Figure 8 below. Strong
acceptance (77%) of the negation wide scope (neg>every) in subject condition by Group
A does not accord with 10% acceptance by English monolingual children. Strong
rejection of the neg>every reading in subject condition by Group B with shorter stay
seemed consistent with the English monolingual’s. However, their strong acceptance
(100%) of the every > neg reading in object condition verifies that they are not following
English monolingual children’s patterns since it is not possible in children English as
well as in adult English.

| Table 4. Acceptance by each group in English Test |
|-----------------|----------------|----------------|--------------|--------------|
| English Scope   | K-E,GroupA     | K-E,GroupB     | E Mono       | E Adult      |
| Subject         | neg>every      | 77%            | 13%          | 10%          | √            |
|                 | every>neg      | 100%           | 100%         | N/A*         | √            |
| Object          | neg>every      | 100%           | 0%           | 90%          | √            |
|                 | every>neg      | 100%           | 100%         | N/A          | *            |

* N/A: Data is not available currently

\textsuperscript{16} As Natalie Batmanian suggested (in personal communication), proficiency might be a factor for Group B
to show different patterns from those of the children in Group A since they have been exposed to English
much less than other children. Proficiency test will be required in the future study to make it clear whether
proficiency is correlated to their scope judgments of QNPs and negation.
The distinct patterns by both K-E bilingual groups are attributable to transfer of Korean negation to English. Strong acceptance of the wide scope reading of object QNPs by both groups must come from Korean negation, which adjoins to $V^0$ directly. In addition, the length of exposure to English causes their variant patterns between groups. Group A with longer shows stronger acceptance of the negation wide scope readings both with subject QNPs (77%) and with object QNPs (100%) contra Group B’s strong rejection of the negation wide scope readings (13%; 0%). Therefore, I conclude that access to the negation wide scope reading (neg>every) is easier for Group A with longer stay than Group B with shorter stay and Group B’s rigid scope reading, the wide scope reading only of QNPs (every>neg), must be influenced by the Korean SFN structure.

5.3 Results from experiments on Korean

15 out of 15 children (100%) accepted the puppet’s statements in the wide scope condition (every > neg) of subject QNPs and of object QNPs. For example, they accepted a statement in a subject QNP condition such as motun kangaci-ka phwul-ul an mek-ess-ta ‘Every puppy didn’t eat grass’ given in the context no puppy ate grass.

In a narrow scope condition of subject quantifiers (neg>every), 11 out of 15 children (73.7%) accepted the puppet’s test statements, which are false based on SFN structure. Only 4 children rejected the trials, agreeing with the target SFN scope interpretation. Furthermore, object QNPs were incorrectly interpreted in a narrow scope.
within negation by 9 children (60%). In other words, only 6 children (40%) rejected the negation-wide scope reading, accessing the target reading of SFN. The results are summarized in Table 5 and in Figure 9.

Table 5. Percent Acceptance by Condition in Korean

<table>
<thead>
<tr>
<th>Korean</th>
<th>Scope</th>
<th>Bilingual children</th>
<th>Adult Korean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject QP</td>
<td>Neg&gt;∀</td>
<td>73.7% (11/15)</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>∀&gt;Neg</td>
<td>100% (15/15)</td>
<td>√</td>
</tr>
<tr>
<td>Object QP</td>
<td>Neg&gt;∀</td>
<td>60% (9/15)</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>∀&gt;Neg</td>
<td>100% (15/15)</td>
<td>√</td>
</tr>
</tbody>
</table>

Figure 9. Percent Acceptance by K-E bilingual children in Korean

The individual results by each group, which is separated depending on length of their stay in the States, are given in the following table. Again, their responses for the wide scope reading (every>neg) of subject QNPs and object QNPs were all “YES” 100% of the time. So, Table 6 contains only the results in neg>every condition.
Table 6. Individual results in Korean test (y: answer of “Yes” and n: answer of “No”)

<table>
<thead>
<tr>
<th>Korean Test</th>
<th>SubjectQP:neg&gt;every (* in adult Korean)</th>
<th>ObjectQP:neg&gt;every (* in adult Korean)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>Age (length of stay/ys)</td>
<td>Story1</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child2 5;3 (5;3)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child3 5;7 (5;7)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child4 5;8 (5;8)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child5 5;8 (5;8)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child14 7;0 (4;10)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child12 6;6 (5;0)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child10 6;5 (5;0)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child1 5;0 (4;0)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child9 6;0 (6;0)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child13 6;7 (6;7)</td>
<td>y</td>
</tr>
<tr>
<td>Group A- long stay</td>
<td>Child15 7;6 (6;3)</td>
<td>n</td>
</tr>
</tbody>
</table>

| Group B- short stay | Child6 5;9 (2;0) | y | n | y | n | y |
| Group B- short stay | Child7 5;10 (1;9) | n | n | n | n | n |
| Group B- short stay | Child8 5;11 (1;11) | n | n | n | n | n |
| Group B- short stay | Child11 6;5 (2;1) | n | n | n | n | n |

| Yes responses | 11 | 6 | 9 | 7 |

Group A (11 children) with longer stay accepted a narrow scope reading of subject QNPs 82% of the time and accepted a narrow scope reading of object QNPs 68% of the time. However, Group B (4 children) with shorter stay “rejected” a narrow scope reading of subject QNPs and object QNPs 88% of the time while they accepted a wide scope reading of QNPs 100% of the time. In other words, they accepted only a wide scope reading with QNPs in any condition. Their interpretation must follow from the Korean SFN structure since only a wide scope reading is possible for subject QNPs and object QNPs with SFN, which adjoins to V in the structure. Group B’s patterns are comparable with major patterns of Korean monolingual children. Recall that Korean monolingual children accepted a wide scope reading of QNPs 82% of the time and accepted a narrow scope reading of QNPs 36.7% of the time in SFN. Furthermore, the Group B’s results of Korean test also verify that Group B’s strong rejection of the negation wide scope reading in English test is influenced by the Korean SFN structure.

On the other hand, acceptance of a narrow scope reading of QNPs by Group A might come from incomplete knowledge distinguishing SFN from LFN by overgeneralizing the flexible structure of LFN to SFN as a minority of Korean
monolingual children did. However, the acceptance rate (68%) for the narrow scope of object QNPs by Group A is far higher than Korean monolingual children’s acceptance (36.7%). The overall acceptance (60%) for the narrow scope of object QNPs by both groups is still much higher than Korean monolingual as illustrated in Table 7 and Figure 10.

Table 7. Percent Acceptances of Object condition in Korean by Korean monolingual children vs. K-E bilingual children

<table>
<thead>
<tr>
<th>Condition</th>
<th>Korean (Kim et al. 2003)</th>
<th>Monolingual</th>
<th>Bilingual</th>
</tr>
</thead>
<tbody>
<tr>
<td>every &gt; Neg in Object</td>
<td>82%</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Neg &gt; every in Object</td>
<td>36.7%</td>
<td>60%</td>
<td></td>
</tr>
</tbody>
</table>

Figure 10. Percent Acceptances in object condition in Korean by Korean monolingual children vs. K-E bilingual children

The higher acceptance of neg>every readings in the bilingual children implies that access to the inverse scope is much easier for K-E bilingual children than for Korean monolingual children. We can hypothesize that the negation-wide scope in English, which is expressed overtly in interaction with object QNPs, influences the acquisition of
Hyun-ju Kim

scope interpretation of QNPs and negation in Korean by accelerating acquisition of the LFN structure. Once they acquire the LFN structure, they overgeneralize it to SFN in Korean. Therefore, I assume that K-E bilingual children’s higher acceptance of the negation wide scope reading results from English influence. The difference of acceptance rate also implies that developmental patterns of the scope interpretation might be different in K-E bilingual children from Korean monolingual children due to English influence. In comparison with the results from English test, the higher acceptance rate of the narrow scope reading with object QNPs follows the strong acceptance of it in English as shown in Table 8.

Table 8. Acceptance of the narrow scope (Neg> ∀) of QNPs in English vs. in Korean

<table>
<thead>
<tr>
<th></th>
<th>Bilingual Children</th>
<th>Adults</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject QP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>80% (12/15)</td>
<td>√</td>
</tr>
<tr>
<td>SFN in Korean</td>
<td>73.7% (11/15)</td>
<td>*</td>
</tr>
<tr>
<td><strong>Object QP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>73.7% (11/15)</td>
<td>√</td>
</tr>
<tr>
<td>SFN in Korean</td>
<td>60% (9/15)</td>
<td>*</td>
</tr>
</tbody>
</table>

Hence, I suggest that negation, overtly expressed higher than VP in the surface structure in English facilitate acquisition of the LFN structure in Korean where negation adjoins to VP besides V. However, K-E bilingual children fail to master distinct structures by negation types (SFN vs. LFN) by overgeneralizing LFN to SFN. Once they are exposed to more data which demonstrate that the SFN structure is different from the LFN structure, they could overcome the overgeneralization of LFN. Back to the results of English, Korean influence in Group A’s acceptance of non-target wide scope readings of object QNPs is verified by their Korean patterns, which allow both readings based on the LFN structure. On the other hand, Group B with shorter stay do not show the facilitated patterns by English by rejecting the negation wide scope (see Table 6), so I assume that English influence is in effect only in Group A, who had been exposed to English longer.

K-E bilingual children accepted the negation wide scope reading both in English and in Korean as shown in Table 8. However, I found that they showed more rejections of the negation wide scope in Korean than in English systematically. For instance, their
rejection of a narrow scope reading of object QNPs is relatively low as 27% of the time (8/30) in English test (Table 3), which seems to follow adult English because the narrow scope reading of object QNPs is possible in English. Their rejection of a narrow scope reading of object QNPs increases to 47% of the time (14/30) in Korean test (Table 6), which also seems to follow adult Korean because the narrow scope reading of object QNPs is not possible in the SFN structure. Even if 20% difference may not be significant statistically, it still informs us that the bilingual children differentiate Korean from English by giving more rejections in Korean test, which are correct judgments. Because the test sentences are all given in SFN, the negation wide scope reading must be rejected both in subject condition and in object condition. Despite English influence, the higher rejection rate of the negation wide scope reading in Korean shows that they do not mix the two languages.

To sum up, K-E bilingual children’s scope interpretations of QNPs and negation have shown clear contrast between the two groups as illustrated in Table 9 and Figure 11 below: Group A with longer stay accepted the negation wide scope reading with subject QNPs/object QNPs with a strong acceptance rate in the Korean test, whereas Group B with shorter stay rejected the negation wide scope reading most of the time. Amount of exposure to English causes this difference between groups, that is Group A with longer stay do not have difficulty to access the inverse scope reading (neg>every) due to English influence, which is argued to facilitate acquisition of the LFN structure. However, Group B with shorter stay show clearly that they access only the linear scope readings (every>neg) in SFN, so English does not influence their interpretation of Korean negation.

<table>
<thead>
<tr>
<th>Korean</th>
<th>Scope</th>
<th>K-E,GroupA</th>
<th>K-E,GroupB</th>
<th>K.Mono</th>
<th>K.Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject</td>
<td>neg&gt;every</td>
<td>73%</td>
<td>13%</td>
<td>N/A</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>every&gt;neg</td>
<td>100%</td>
<td>100%</td>
<td>N/A</td>
<td>√</td>
</tr>
<tr>
<td>Object</td>
<td>neg&gt;every</td>
<td>68%</td>
<td>13%</td>
<td>37%</td>
<td>*</td>
</tr>
<tr>
<td></td>
<td>every&gt;neg</td>
<td>100%</td>
<td>100%</td>
<td>82%</td>
<td>√</td>
</tr>
</tbody>
</table>

Table 9. Acceptance by group in Korean test
In addition, K-E bilingual Group A’s patterns of acceptability in scope ambiguity are consistent with the patterns of a minority of Korean monolingual children. Group B with shorter stay do not allow the negation wide scope in subject condition and in object condition, which belongs to major patterns of Korean monolingual children.

5.4 Discussion

The results presented so far suggest that K-E bilingual children with longer stay do not pass through the same stage, the so-called ‘isomorphic stage’ as monolingual children do in their acquisition of scope interaction of QNPs and negation. Previous studies (Musolino 1997; Kim et al 2003) proposed that most English monolingual children and major group of Korean monolingual children are initially restricted to isomorphic readings or linear scope readings, which follow left-to-right order. However, K-E bilingual children with longer stay access the inverse scope reading as well as the linear scope reading of QNPs in both languages even if it is sometimes not a target reading in adult grammar. Remember that the narrow scope reading of subject QNPs in Korean SFN is not widely accepted by Korean adult speakers and the wide scope reading of object QNPs is not available in English. Nevertheless, the K-E bilingual accepted the illegitimate readings for each language, which seems puzzling because their patterns do
not follow general patterns of English monolingual children or of Korean monolingual children. A hybrid grammar in bilingual children cannot be a satisfactory answer since many studies have reported that bilingual children possess early language differentiation at the syntactic level (Genesee 1989; Paradis and Genesee 1996; Hulk 1997) unless development patterns of K-E bilingual children are extremely unique.

First of all, Group A with longer stay’s acceptance of the narrow scope reading of subject and object QNPs (neg>every) with SFN in the Korean test must come from failure of acquiring the different scope interaction by negation type as 36.7% of monolingual children did. Once they acquire that another position (adjunction to VP) is available in LFN, they would overgeneralize the positional flexibility of negation to SFN at LF due to incomplete knowledge of differentiating the two systems by negation types (SFN vs. LFN). K-E bilingual children’s stronger acceptance of the negation wide scope reading than Korean monolingual children results from accelerated acquisition of the LFN structure by English influence. Thus, I conclude that K-E Group A’s narrow scope reading of QNPs in Korean is generated by the following LF representation (44) when negation adjoins to VP₁, which is uniform for both SFN and LFN. I assume that their patterns are still in accordance with Korean monolingual children’s developmental patterns, who fail to acquire distinct LF structures of SFN and LFN, although they belong to the minority 36.7% group.

(44) Proposed LF structure of Korean negation in K-E bilingual children

\[
\text{SFN and LFN}
\]

\[
\text{TP}
\]

\[
\text{SpecT}
\]

\[
\text{T'}
\]

\[
\text{T}
\]

\[
\text{VP}_1
\]

\[
\text{Neg}
\]

\[
\text{VP}_1
\]

\[
\text{Subject}
\]

\[
\text{VP}_2
\]

\[
\text{Object}
\]

\[
\text{V}
\]

\[
\text{Neg}
\]

\[
\text{or}
\]
On the other hand, Group B with shorter stay allowed only the wide scope reading of QNPs (every>neg) in subject and in object. I assume that they do not have English influence over Korean negation. Negation adjoins to V⁰ but not to VP in their SFN structure. Thus, English influence on Korean occurs only in Group A with longer stay.

Even after QR of subject/object QNPs is applied, which is obligatory following *Optionality of QR* (Aoun & Li 1993) because they are in thematic position, scope relation between QNPs and negation does not change. Depending on where negation adjoins, scope of negation is determined with respect to subject/object QNPs: Neg, which adjoins to VP₁, takes wide scope over QNPs, but Neg, which adjoins to V⁰, takes narrow scope below QNPs. For instance, the LF representations for a sentence like *Miki-ka motun orenci-lul an sa-ss-ta* ‘Mickey didn’t buy every orange’ are suggested as in (45).

\[(45)\]

\[
\begin{array}{c}
\text{TP} \\
\text{SpecT} \\
\text{VP₁} \\
\text{T'} \\
\text{T} \\
\text{VP₁} \\
\text{Neg} \\
\text{motun orenci-lul₁} \\
\text{VP₁} \\
\text{Miki-ka} \\
\text{VP₂} \\
\text{t₁} \\
\text{V} \\
\text{QR} \\
\text{sa} \\
\text{Neg}
\end{array}
\]

In the case of that negation adjoins to VP₁, object *motun orenci-lul* undergoes QR to VP₁, but not to the higher position such as a TP adjoined position since VP₁ dominating negation becomes a NIB. As a result, the MNSC is satisfied. Thus, negation c-commands the object QNP *motun orenci* and takes scope over it even after QR. If negation adjoins to V⁰, there will be no restriction for the object QNP raising since negation does not produce a NIB. Without a NIB, *motun orenci-lul* can move either to a VP₁ adjoined position or to a TP adjoined position. QR to either position does not make a scope change...
since object motun orenci-lul c-commands negation in either position, so the object QNP takes wide scope over negation.

In terms of English grammar of K-E bilingual children, it must be different from monolingual children’s English grammar. In comparison to English monolingual children, there is a big difference in acceptance rate of the inverse scope reading of subject QNPs since only 10% of English children accepted the “neg>every” condition of subject QNPs while 80% of the K-E bilingual children did. Figure 7 is repeated below to recall the difference between the two groups.

![Figure 7. Percent Acceptances of the narrow scope (Neg > ∀) of QNPs in English by English monolingual children vs. by Korean-English bilingual children](image)

Failure of access to the narrow scope reading of subject QNPs in English monolingual children is argued to be due to lack of reconstruction of subject QNPs in their grammar. Considering that both readings, every>neg and neg>every, are available in K-E bilingual children’s Korean due to LF flexible positions of negation, Korean negation structure transfers to English and it influences the scope interpretation in English. Thus, their LF representation in English is proposed as follows:
(46) Proposed LF representation of English negation in K-E bilingual children

As illustrated in the tree structure (46), their grammar lacks projection of NegP due to interference of Korean negation. By transferring positional flexibility of Korean negation, negation adjoins to V₀ or VP.

I consider three possible analyses in order to give a theoretic account of scope ambiguity of subject QNPs in K-E bilingual children. First, I can assume that reconstruction does not operate in their grammar just like in English monolingual children’s. Then the negation-wide scope will be derived by raising negation to TP as in (47). Adjunction of negation to lower positions such as VP or V₀, then, leads to the surface scope reading (every>neg).

(47) \[ TP \text{ Neg} [TP \text{ every horse} | TP \text{ t₁ did} [VP (Neg) [VP t₁ [V(Neg) jump over the fence]]]]] \]

However, a negation raising to TP analysis is undermined when we consider the scope interaction of negation and frequency adverbs such as cwulo ‘usually’ in Korean. When the adverb cwulo ‘usually’ interacts with negation, it always takes scope over negation in SFN and in LFN regardless of the position of the adverb, as in the example (48).
It is not likely that K-E bilingual children have acquired negation raising to TP in their English since no input data to motivate such a movement exists in Korean or English. Thus, K-E bilingual children’s negation wide scope reading with subject QNPs cannot be derived by negation raising.

Secondly, we can hypothesize that the inverse scope reading could be derived by scope reconstruction of subject QNPs if K-E bilingual children need not have the same grammar as monolingual children. The VP-internal position of subject, which is lower than the VP adjoined negation, in Korean LF (44) facilitates the operation of reconstruction to derive the target reading. The LF representation is like (49).

(49) $[(TP \text{ every horse})_1 [TP t_1 \text{ did } [VP \text{ Neg } [VP t_1 \text{ jump over the fence}]])]]$ (English)

reconstruction

Thirdly, we can suppose that subject might not raise to the Spec, TP in their English. Considering that subject is VP-internal in Korean, a lack of subject raising seems plausible. Such a view of lack of subject raising is consistent with the A-Chain Deficit Hypothesis (ACDH) of Borer and Wexler (1987; 1992). They argue that A-chains are ungrammatical for a child until a certain age or level of maturation. Borer and Wexler used this assumption to explain why children had difficulty on verbal passives in English and some other languages, because verbal passives in these languages involve A-chains. However, the K-E bilingual children who declare scope ambiguity of subject QNPs belong to Group A with longer stay. Their English is near native and fluent. Considering

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17 Thank John Bailyn for suggesting that a lack of subject raising hypothesis would be relevant in K-E bilingual children.
the word order in their production, I doubt that they do not raise subject to the left to Modals or Neg at all.

Based on the proposal made by Chomsky (1995) that subjects raise to check off an EPP feature, it might be possible that their English raises the subject to Spec, TP to check off an EPP feature and it may leave other features such as case or uninterpretable \( \phi \)-features (number, gender) behind at the trace. Considering errors in number agreement attested in previous literature, it is feasible to assume that the subject movement does not need to involve movement of all the features in their English. Feature checking of other features (\( \phi \)-features, case), which is concomitant with subject raising, might not have been done for some reasons (e.g. Korean interference: agreement of \( \phi \)-features is not necessary in Korean). Consequently they interpret the LF position of subject QNPs in the VP-internal position, where all the features of the subject QNP, except an EPP feature, remain. The structure proposed for this approach is represented as follows:

(50) Incomplete feature raising of subject DP in K-E bilingual children

The negation wide scope reading is induced when negation adjoins to VP and the negation narrow scope reading is derived from negation which adjoins to V. However, this approach may raise other issues more than scope effect, so more study of this is required.

The results in the condition of object QNPs in English also support the cross-linguistic influence hypothesis: 100% of K-E bilinguals accepted the wide scope reading of object QNPs in English. The wide scope of object QNPs is not possible if their grammar projects NegP and the Minimal Negative Structure Constraint (MNSC) is in
effect (Beck and Kim 1997). Object QNPs in English cannot scope over negation since object QNPs should not be raised over NegP to satisfy the MNSC. Thus, this result verifies that negation in their English must not have its own projection in the structure. Note that their acceptance (100%) of the ill-formed wide-scope of object QNPs is even stronger than acceptance of the legitimate object QNPs-narrow scope reading, which is 73.7%. The relatively weaker acceptance 73.7% of the narrow scope reading is consistent with the weaker acceptance of the narrow scope reading of object QNPs (60%) than of the wide scope of object QNPs (100%) in Korean as illustrated in Figure 12.

Figure 12. Percent acceptance by K-E bilingual children in Korean(Ks) and in English(E): ‘’ indicates impossible readings in adult grammar: i) every in subject >neg is possible in E and Ks ii) neg> every in subject is possible in E but not in Ks iii) every in object >neg is impossible in E, but possible in Ks iv) neg>every in object is possible in E, but not in Ks. (Ks:SFN in Korean)

Therefore, the non-target wide-scope reading of object QNPs in English must be influenced by Korean negation which lacks NegP. Remembering that negation can be adjoined to V0 or to VP in K-E bilingual children’s Korean grammar, the wide-scope reading of object QNPs must also be due to transfer of LF flexible positions of negation from Korean as in (51a) to English negation as in (51b).

(51)  a. \[ \text{[VP1 [VP1 motun orenci-lul1 [VP1 Miki-ka [ VP2 t1 [V neg sa ]]](neg)]]} –ss-ta \\
Mickey-nom every orange-acc neg buy (neg) pst-decl

b. \[ \text{[TP Mickey1 did [VP not [VP every orange2 [VP t1 [V' (not) buy ] t2 ]]]]]}
The structure with negation adjoining to either $V^0$ or VP, consequently, results in scope ambiguity of object QNPs. In other words, the wide scope of object QNPs is not due to QR over negation. As represented in (52), object QNP *every orange* takes scope over negation even after local QR if negation adjoins to $V^0$.

(52) LF representation

QR of the object *every orange* is obligatory since it is in a thematic position and its variable ($t_{\text{object}}$) left by QR is bound by its most local A’-binder *every orange*. Thus, the representation (52) does not violate the MBR by raising *every orange* to the VP adjoined position. In addition, the MNSC is also satisfied because the binder *every orange* becomes still dominated by a NIB, VP, which *not* is adjoined to, after QR. Therefore, the representation (52) does not crash.

Considering the between-group differences in the results of English test, the length of stay or amount of exposure to English must be in effect in acquisition of scope interaction of QNPs and negation. Group B with shorter stay accepted only a wide scope reading of QNPs both in subject and in object, which must come from SFN in Korean. Group A which has been stayed longer than Group B showed more scope flexibility, which is attributable to LFN in Korean. Thus, I assume that Group B with short stay must
have English structure with negation adjoining to $V^0$ by transferring SFN negation to English.

In terms of acquisition of scope interaction of negation and QNPs in English, I conclude that K-E bilingual children do not follow the same development patterns as those of English monolingual children due to transfer of the Korean negation structure. Transfer of the Korean negation structure interferes with acquisition of the English negation structure such as NegP in both groups of the K-E bilingual. Therefore, emergence of non-target scope ambiguity is not due to incorrect grammar such as violating scope principles or constraints. Rather, I propose that it is due to incomplete acquisition of English negation.

6. Conclusion

We have argued that cross-linguistic influence can occur in bilingual language acquisition of English negation. Korean negation is distinct from English negation: English negation projects its own projection, NegP and its structural position is determined, whereas Korean negation does not project NegP but may adjoin to VP or $V^0$. In addition, Korean negation manifests a more complicated system with two forms, SFN and LFN. Negation in LFN is flexible in its position by adjoining to VP or $V^0$ while negation in SFN adjoins to $V^0$. Scope interaction of QNPs and negation is determined by their c-commanding relations. Thus, acquiring the correct hierarchical relations between QNPs and negation is crucial in terms of acquisition of scope interaction of QNPs and negation.

Due to the intrinsic difference of Korean negation from English negation, I discovered that acquisition patterns of scope interaction in the Korean monolingual are slightly different from those of the English monolingual: that is, English monolingual children dominantly showed isomorphism with 10% acceptance of the inverse scope reading, while more Korean monolingual children accepted the inverse scope reading with a higher acceptance rate of 40% despite Korean children’s major tendency of isomorphism. English speaking children’s isomorphic scope interpretation is attributed to their incomplete knowledge of scope reconstruction of subject QNPs. On the other hand,
Korean monolingual children’s isomorphic reading comes from failing to differentiate the LFN structure from the SFN structure. Namely, they overgeneralize the SFN structure to the LFN structure at LF. As for the children (37% in SFN and 40% in LFN), who were able to access the inverse scope reading whether it is targeted or not, they seem to acquire positional flexibility of LFN. However, they (37% in SFN) also fail to differentiate the LFN structure from the SFN structure by overgeneralizing the LFN structure to the SFN structure.

In comparison with Korean monolingual children, K-E bilingual children’s accessibility of the inverse scope reading is much stronger (70%) in Group A with longer stay. The reason of the stronger inverse scope reading in K-E bilingual children compared to monolingual children might be the position of negation. English negation is expressed higher than the object overtly in English syntax, which facilitates acquisition of another available position (the VP adjoined position) of long form negation in Korean. However, English influence is not in effect in Group B with short stay by showing that they do not allow the negation wide scope reading in subject condition and in object condition. Their patterns are comparable to major patterns of Korean monolingual children, while K-E bilingual Group A’s patterns of acceptability in scope ambiguity are consistent with the patterns of a minority of Korean monolingual children. This implies that scope ambiguity of the K-E bilingual children does not result from idiosyncratic grammar but it is still constrained by UG. Therefore, the UG constrained acquisition hypothesis holds in K-E bilingual acquisition.

Comparing the development of scope interpretation in monolingual English to the development in bilingual English, I conclude that the developmental patterns of K-E bilingual children are not the same as those of English monolingual children. K-E bilingual children accept both readings where two readings are available in the adult grammar, suggesting that they are not restricted to an isomorphic interpretation. Following the cross-linguistic influence hypothesis, the scope ambiguity which K-E bilingual children produce emerges due to transfer of the Korean negation structure. Transfer of the Korean negation structure results in delayed acquisition of the English negation structure projecting NegP.
In conclusion, the cross-linguistic influence hypothesis is supported by the experimental studies of acquisition of scope interaction of QNPs and negation in K-E bilingual children with the results that K-E bilingual children need not follow the same development patterns as those of English monolingual children due to transfer of the Korean negation structure to English. Their different developmental patterns are attributable to transfer of positional flexibility of negation in K-E bilingual children’s Korean grammar. Furthermore, acquisition of the English negation structure delays due to transfer of the Korean negation structure. In terms of acquisition of Korean negation, however, negation which is located higher than object in English syntax might accelerate acquisition of the LFN structure that negation adjoins to VP as well as V_0 in Korean. In terms of amount of exposure effect, K-E bilingual group with longer stay have the English influence in acquisition of Korean negation but K-E bilingual group with short stay do not show the English-influenced patterns in their Korean. Finally, I propose that transfer may occur in both directions, from Korean to English and from English to Korean as shown in Group A with longer stay, whereas transfer is mono-directional, namely from Korean to English only, in Group B with shorter stay.

References


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Appendix

I. English Test

• Test statements
1. Mickey Mouse did not buy every apple.
2. Mickey Mouse did not buy every orange.
3. Every horse did not jump over the fence.
4. Minnie Mouse did not eat every muffin.
5. Minnie Mouse did not eat every cookie.
6. Everybody did not play in the sandbox.
7. Everybody did not ride the seesaw.

• Filler statements
8. There are three apples left at the grocery store.
9. Mickey Mouse couldn't find oranges at the store.
10. The barn was too high for horses to jump over.
11. Four horses are practicing jumping.
12. Mickey Mouse loves blueberry muffins.
13. Minnie Mouse didn't want to give Mickey Mouse cookies
14. There is no slide in the playground.
15. The sandbox was wet because of rain.

II. Korean Test

• Test statements
1. 둘리는 모든 자동차 장난감을 안 닦았다
   Twulli-nun motun catongcha cangnankam-ul an tak-ass-ta
   ‘Dooly didn't clean every car’

2. 모든 강아지가 풀을 안 먹었다
   Motun kangaci-ka phwul-ul an mek-ess-ta
   ‘Every dog didn't eat grass’

3. 모든 망아지가 풀을 안 먹었다
   Motun mangaci-ka phwul-ul an mek-ess-ta
   ‘Every horse didn't eat grass’

4. 모두가 폴라 베어를 안 만겼다
   Motwu-ka polar bear-lul an man-cyess-ta
   ‘Everybody didn't pet the polar bear’

5. 모두가 코끼리를 안 만겼다
   Motwu-ka khokkili-lul an man-ci-ess-ta
   ‘Everybody didn't pet the elephant’

6. 둘리는 모든 피자를 안 먹었다
   Dooly-nun motun phica-lul an mek-ess-ta
7. 'Dooly didn't eat every pizza'

Dooly-nun motun chikhin-ul an mek-ess-ta
'Dooly didn't eat every chicken'

8. 'Dooly cleaned all the teddy bears'

Dooly-nun motun kom inhyeng-ul takk-ass-ta

9. 'Dooly didn't clean the car that he got as a birthday gift because it was clean'

Dooly-ka sayngil senmwul-lo patun catongcha-nun kKaykkuthayse an takk-ass-ta

10. 'The farmer offers dogs delicious bones'

Nongpu-ka kangaci-eykey masiss-nun ppye-lul kac-ta cu-ess-ta

11. 'Horses wanted to have carrots'

Mangaci-nun tangkun-i mek-ko sip-ess-ta

12. 'A polar bear was not at the zoo'

Polar bear-nun tongmwulwon-ey eps-ess-ta

13. 'Minnie Mouse is scared of the elephant'

Mini mawus-nun khokkili-lul mwusewe hay-ss-ta

14. 'Dooly loves bacon pizza'

Dooly-nun peyikhen phica-lul cohahan-ta

15. 'There is only chicken in the refrigerator'

Nayngcangko an-ey-nun chikhin-man iss-ess-ta