

Verb-raising and Grammar Competition in Korean: Evidence from Negation and Quantifier Scope

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Abstract: In a head final language, verb-raising is hard to detect since there is no evidence from the string to support a raising analysis. This is so both for children acquiring the language and for linguists developing an analysis of it. If the language has a clitic-like negation that associates with the verb in syntax, then scope facts concerning negation and a quantified object NP could provide evidence regarding the height of the verb. Even so, such facts are rare, especially in the input to children, and so we might be led to expect that not all speakers exposed to a head-final language acquire the same grammar as far as verb-raising is concerned. In this paper, we present evidence supporting this expectation. Using experimental data concerning the scope of quantified NPs and negation in Korean, extracted from both adults and 4 year-old children, we show that there are two populations of Korean speakers: one with verb-raising and one without.

Keywords: verb-raising, negation, quantifier, scope, grammar competition, poverty of the stimulus, head final language, Korean

1 Introduction

The argument from the poverty of the stimulus has maintained a central place in the development of generative grammar at least since Chomsky (1965). The argument runs like this. There is a piece of grammatical knowledge G that can be attributed to adult speakers of a language. Examination of the input shows that the ambient language does not uniquely determine G . That is, the primary linguistic data that the child is exposed to is compatible with a range of hypotheses that includes (but does not require) G . Given that adults know G and that G represents only one point in a range of hypotheses compatible with experience, it follows that G must be determined

innately. In other words, all of the other hypotheses compatible with the primary linguistic data are excluded *a priori*. Learners acquire G because it is the unique point of intersection between the primary linguistic data and the innate hypothesis space. In this paper, we present a novel consequence of the poverty of the stimulus. We will consider a case in which the learner's innate hypothesis space arguably provides at least two hypotheses that are compatible with the primary linguistic data. In this case, experience does not determine which of these is the correct grammar. Consequently, some learners acquire one grammar and others acquire the other. In short, even given a restricted and innately determined hypothesis space, experience is sometimes insufficient for grammar transmission from one generation to the next.

In particular, we will examine the position of the verb in Korean. In a head-final language like Korean, verb-raising is hard to detect since there is no evidence from simple SOV strings that would differentiate between a structure in which the verb is sitting in V and one in which it has raised to INFL. This is so both for children acquiring the language and for linguists developing an analysis of it. Indeed, syntacticians examining Korean have made arguments in both directions with some arguing that there is no verb-raising (J. Yoon 1994, H. Han and M.-K. Park 1994, M.-K. Park 1998) and others arguing that verb-raising does occur (D.-I. Cho 1994, Y.-S. Choi 1999, Koisumi 2000, Otani and Whitman 1991, K.-B. Park 1992, E.-Y. Yi 1994). As we will see below, neither the evidence for a raising analysis nor the evidence for an analysis without raising is definitive. All of the data used in the argumentation in the literature has explanations consistent with either analysis.

One potential source of information which would be more instructive concerns the syntax of negation. Because Korean has a clitic-like negation that associates with the verb in syntax, scope facts concerning negation and a quantified object NP could provide evidence regarding the height of the verb. Even so, such facts are rare, especially in the input to children, and so we might be led to expect that not all speakers exposed to a head-final language acquire the same grammar as far as verb-raising is concerned. Indeed, we present evidence here supporting this expectation from Korean. Using data obtained from psycholinguistic experimentation, we show that there are two populations of Korean speakers: one with verb-raising and one without.

This paper is organized as follows. In section 2, we begin by reviewing the kind of evidence used in the linguistic literature to determine whether Korean exhibits verb-raising. We consider evidence from null object constructions, 2.1, scrambling and coordination, 2.2, negative polarity item licensing, 2.3 and coordination of an untensed conjunct with a tensed one, 2.4. We show that in all these cases, no firm conclusions can be drawn regarding the availability of verb-raising in Korean, as all the data claimed to support a verb movement analysis are compatible with a non-verb-movement grammar and vice-versa. Next, we consider evidence involving the position of the verb with respect to negation, 3.1, and scope interactions between negation and quantified NPs, 3.2. We show that while the evidence from scope interactions would be informative regarding the possibility of verb-raising in Korean, the extant literature on this topic is plagued by contradictory conclusions, giving one the impression that Korean syntacticians cannot agree on what the facts are, 3.3. Since only facts

involving negation and quantified NPs hold the promise of settling the issue of whether Korean is a verb-raising language, it becomes crucial that the relevant facts be determined as precisely as possible. In order to achieve this goal, we conducted two psycholinguistic experiments using a technique known as the Truth Value Judgment Task (Crain and Thornton, 1998), devised to elicit reliable interpretive judgments, 4.1 and 4.2. After presenting our findings in section 4, we present their implications regarding the availability of verb-raising in Korean in section 5.

2 The Issue of Verb-raising in Korean

Traditionally, differences in verb placement with respect to adverbs have been used to argue for or against verb-raising to inflection (INFL) for a given language (Emonds 1978, Pollock 1989). Consider the data in (1-2).

(1) French:

- | | | |
|----|---|--------------|
| a. | * Jean souvent embrasse Marie.
Jean often kisses Marie | (*S Adv V O) |
| b. | Jean embrasse souvent Marie.
Jean kisses often Marie
'Jean often kisses Marie.' | (S V Adv O) |

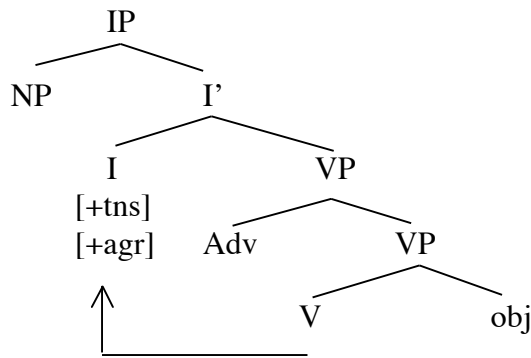
(2) English:

- | | | |
|----|-------------------------|--------------|
| a. | John often kisses Mary | (S Adv V O) |
| b | *John kisses often Mary | (*S V Adv O) |

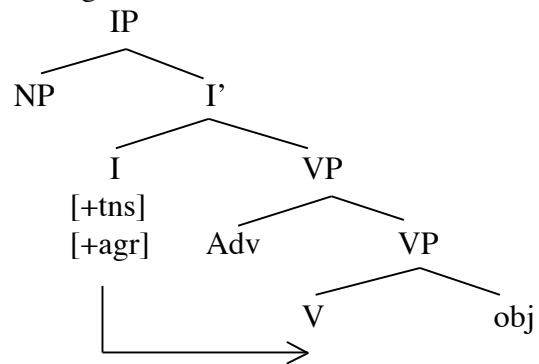
Assuming that French and English clauses have similar hierarchical structure and that 'often'-type adverbs are placed in the same position in both languages, namely adjoined to VP, the word order in which the verb precedes the adverb is taken to be evidence for verb-raising, as in French (3a), and the order in which verb follows the adverb is taken to be evidence for INFL-lowering, as in English (3b).

(3)

a. French



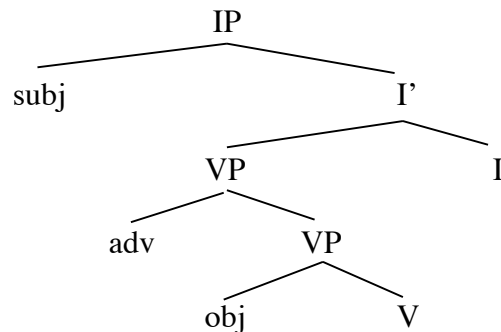
b. English



However, in a head-final language like Korean (4), with specifiers/adjuncts on the left of the verb as in (5), verb-raising is hard to detect because there is no evidence from the string to support a raising analysis. Whether the verb raises or not, it will occur to the right of such adverbial elements.

- (4) Yuri-ka Toli-lul cacwu ttayli-n-ta.
 Yuri-NOM Toli-ACC often hit-PRES-DECL
 'Yuri often hits Toli.'

(5)



We thus need to resort to arguments other than those relying on the string order between the verb and a diagnostic element to settle the matter. In what follows, we examine such arguments claimed in the literature to demonstrate that Korean either does or does not exhibit verb-raising.

2.1 Null Object Constructions (NOC)

Otani and Whiman (1991) argue that the sloppy reading in NOC in Japanese (and Korean) is evidence for verb-raising. They propose that through verb-raising, NOC results in an empty VP, analogous to VP ellipsis in English, allowing sloppy reading (6), just as VP ellipsis in English does (7).

- (6) A: John-un caki-uy pyenci-lul pely-ess-ta.
John-TOP self-GEN letter-ACC discard-PST-DECL
'John threw away self's letter.'
- B: Mary-to [e] pely-ess-ta.
Mary-also discard-PST-DECL
'Mary_j also threw out self_j's letters.' (sloppy reading)
'Mary also threw out John's letters.' (strict reading)
- (7) John threw away his letter; Mary did [_{VP} e] too.

Hoji (1998), however, shows that the sloppy-like readings in NOC are not the genuine sloppy reading attested in VP ellipsis constructions. While English VP-ellipsis examples generally have sloppy readings available, the corresponding Korean NOCs do not always do so. This is illustrated in (8)-(9).

- (8) A: John consoled himself.
B: Bill did too. (✓strict reading, ✓sloppy reading)
- (9) A: John-un cakicasin-ul wylohayecwu-ess-ta.
John-TOP self-ACC console-PST-DECL
'John consoled himself.'
- B: Bill-to [e] wylohayecwu-ess-ta.
Bill-also console-PST-DECL
'Bill consoled [e] too.' (✓strict reading, *sloppy reading)

According to Hoji, sloppy-like readings in NOCs arise because of the way the content of the null argument is recovered from discourse, which can be a definite or an indefinite. In (6), the null argument corresponds to indefinite *letters*, which can be interpreted as John's letters (corresponding to strict reading) or Mary's letters (corresponding to sloppy reading). In (9), the null argument is definite and refers to *John*, the most salient entity in the discourse, only allowing the strict reading. If Hoji is correct, NOC examples with sloppy-like readings have no bearing on the issue of verb-raising.

2.2 Scrambling and Coordination

Koisumi (2000) argues that the verb raises all the way up to COMP in Japanese (and in Korean), using examples from coordination and scrambling, with the reasonable assumption that coordinate structures conjoin syntactic constituents of like categories. If we apply Koisumi's arguments to Korean examples, then 'Subject [Object and Object] Verb' coordinate structure is derived through a coordination of sub-clauses (represented as FPs below), with across-the-board (ATB) verb-raising at least to INFL. This is illustrated in (10). Moreover, '[Subject Object] and [Subject Object] Verb' coordinate structure is derived through IP coordination, with ATB verb-raising to COMP, as illustrated in (11). Crucially, the coordinate structures (FP and IP below) can be scrambled, supporting that they form constituents.

- (10) Mary-ka [[_{FP} motun sakwa-lul t_i] kuliko [_{FP} motun panana-lul t_i]] mek_i-ess-ta.
 Mary-NOM every apple-ACC and every banana-ACC eat-PST-DECL
 'Mary ate every apple and every banana.'

- (11) [[_{IP} Mary-ka motun sakwa-lul t_i] kuliko [_{IP} Nancy-ka motun panana-lul t_i]]
mek_i-ess-ta.
Mary-NOM every apple-ACC and Nancy-NOM every banana-ACC
eat-PST-DECL
'Mary ate every apple and Nancy ate every banana.'

But all the examples Koisumi provides are a subset of ATB XP (or X')-extraposition. Similar examples can be constructed where the ATB extraposed materials contain more than just the verb, as in (12)-(13). So, the kind of data Koisumi provides does not have any bearing on the issue of verb-raising.¹

- (12) Mary-ka [[_{FP} motun sakwa-lul t_i] kuliko [_{FP} motun panana-lul t_i]] **cal**
mek_i-ess-ta.
Mary-NOM every apple-ACC and every banana-ACC well
eat-PST-DECL
'Mary ate every apple and every banana well.'
- (13) [[_{IP} Mary-ka motun sakwa-lul t_i] kuliko [_{IP} Nancy-ka motun panama-lul t_i]]
cal mek_i-ess-ta.
Mary-NOM every apple-ACC and Nancy-NOM every banana-ACC
well eat-PST-DECL
'Mary ate every apple and Nancy ate every banana well.'

2.3 Negative Polarity Item (NPI) Licensing

In a negative sentence, regardless of the negation type it contains, an NPI can appear in both subject and object positions in Korean (14-15). Descriptively, NPIs are possible as long as there is a licenser (negation) in the same clause (Clause-mate Condition, H.-S. Choe 1988).

- (14) a. John-un amwukesto an mek-ess-ta.
John-TOP anything NEG eat-PST-DECL
'John didn't eat anything.'

¹ See Fukui and Sakai (2003) for a critique of Koizumi's (2000) arguments on string-vacuous verb-raising in Japanese.

- b. John-un amwukesto mek-ci ani ha-yess-ta.
 John-TOP anything eat-CI NEG do-PST-DECL
 ‘John didn’t eat anything.’
- (15) a. Amwuto kwaca-lul an mek-ess-ta.
 anyone cookie-ACC NEG eat-PST-DECL
 ‘Nobody ate the cookies.’
- b. Amwuto kwaca-lul mek-ci ani ha-yess-ta.
 anyone cookie-ACC eat-CI NEG do-PST-DECL
 ‘Nobody ate the cookies.’

Y.-S. Choi (1999) takes this as evidence for verb-raising. Assuming that negation is a clitic on the verb, he argues that NPIs in both subject and object positions are licensed because they are in the scope of negation once the verb moves up along with the cliticized negation.

But it can be shown that scope of negation and NPI licensing domain do not always go together. First, as we will see in section 3.3, Korean speakers do not agree on judgments concerning scope of negation and argument QPs, but there is no disagreement as to the status of sentences like (14) and (15). Second, in sentences with inherently negative predicates, NPIs are licensed even though the negative predicate does not take scope over it, as shown in D. Chung and H.-K. Park (1997) with examples as in (16)-(17).

- (16) a. Motun mwulken-i chayksang-wiey eps-ta.
 every thing-NOM desk-on not-exist-DECL
 ‘None of the things are on the desk.’ ($\sqrt{\text{every}} > \text{neg}$, $*\text{neg} > \text{every}$)
- b. Amwukesto chayksang-wiey epsta.
 anything desk-on not-exist-DECL
 ‘Nothing is on the desk.’

- (17) a. John-i motun salam-ul mol-ass-ta.
 John-NOM every person-ACC not-know-PST-DECL
 ‘John knew no one.’ ($\sqrt{\text{every}} > \text{neg}$, $*\text{neg} > \text{every}$)
- b. John-i amwuto mol-ass-ta.
 John-NOM anyone not-know-PST-DECL
 ‘John did not know anyone.’

Third, Chung and Park show that some NPIs in Korean cannot be in the scope of negation, even though they require a clause-mate negation to be licensed. An example of such NPI is *celtaylo* (‘absolutely’), as in (18).

- (18) a. Ku-nun celtaylo kukos-ey ga-ci ani ha-yess-ta.
 he-TOP absolutely there-to go-CI NEG do-PST-DECL
 ‘It is absolutely true that he did not go there.’
 ‘*It is not the case that he absolutely went there.’
- b. Ku-nun celtaylo kukos-ey an ga-ss-ta.
 he-TOP absolutely there-to NEG go-PST-DECL
 ‘It is absolutely true that he did not go there.’
 ‘*It is not the case that he absolutely went there.’

All these facts show that NPI licensing in Korean does not coincide with scope of negation, and so it has no bearing on the issue of verb-raising.

2.4 Coordination of an Untensed Conjoint with a Tensed Conjoint

An argument against verb-raising is provided in J. Yoon (1994). He argues that inflectional suffixes in Korean are syntactically independent and combine with roots not by verb-raising, but by what he calls ‘phrasal affixation’: that is, inflections cliticize to phrases for which they subcategorize in morphology. His argument is based on coordinate structures conjoining an untensed clause and a tensed clause. He proposes that when tense is specified only on the verb in the last conjoint, the

coordinate structure instantiates VP-level conjunction as in (19), whereas when tense is specified in all the conjuncts, IP-level coordination is involved as in (20). If Yoon's proposed structure for untensed conjuncts is correct, then the verb in the final tensed conjunct cannot be combining with inflections through verb-raising. This is so because verb-raising would violate Coordinate Structure Constraint. The only possibility then is that the inflections lower on to appropriate places in morphology.

- (19) a. John-i [[_{VP} pap-ul mek-ko] [_{VP} kulus-ul chiwu]]-ess-ta.
 John-NOM meal-ACC eat-CONJ dishes-ACC clean-PST-DECL
 'John ate the meal and cleaned the dishes.'
- b. [[_{VP} John-i pap-ul mek-ko] [_{VP} Mary-ka kulus-ul chiwu]]-ess-ta.
 John-NOM meal-ACC eat-CONJ Mary-NOM dishes-ACC clean-PST-DECL
 'John ate the meal and Mary cleaned the dishes.'
- (20) a. [[_{IP} John-i pap-ul mek-ess-ko] [_{IP} *pro* kulus-ul chiwu-ess]]-ta.
 John-NOM meal-ACC eat-CONJ dishes-ACC clean-PST-DECL
 'John ate the meal and cleaned the dishes.'
- b. [[_{IP} John-i pap-ul mek-ess-ko] [_{IP} Mary-ka kulus-ul chiwu-ess]]-ta.
 John-NOM meal-ACC eat-PST-CONJ Mary-NOM dishes-ACC clean-PST-DECL
 'John ate the meal and Mary cleaned the dishes.'

Yoon provides three arguments for his proposed coordinate structures. First, noting that NPIs in Korean are possible in both subject and object positions licensed by a clause-mate negation, Yoon argues that *amwuto* ('anyone') is licensed in (21a) with VP-level coordination because it is in the same clause as *ani*. But in (21b), with IP-level coordination, *amwuto* is not licensed because it is not in the same clause as *ani*.

- (21) a. Amwuto [[_{VP} pap-ul mek-ko] [_{VP} kulus-ul chiwu-ci]] ani ha-yess-ta.
 anyone meal-ACC eat-CONJ dishes-ACC clean-CI NEG do-PST-DECL
 'No one ate the meal and cleaned the dishes.'

- b. *[[_{IP} Amwuto pap-ul mek-ess-ko] [_{IP} kulus-ul chiwu-ci ani ha-yess]]-ta.
 anyone meal-ACC eat-PST-CONJ dishes-ACC clean-CI NEG do-PST-DECL
 ‘No one ate the meal and cleaned the dishes.’

Second, in (22a), scrambling of *pap-ul* (‘meal-ACC’) is fine even though this is a violation of Coordinate Structure Constraint. Yoon says that scrambling of *pap-ul* is licensed because it adjoins to VP, and from there it properly binds its trace, in the sense of Saito (1985). In contrast, in (22b), scrambling of *pap-ul* is ruled out because it has moved into the first clausal conjunct, and from there it cannot properly bind its trace in the second clausal conjunct.

- (22) a. John-i pap-ul_i [[_{VP} chayk-ul ilk-ko] [_{VP} t_i mek]]-ess-ta.
 John-NOM meal-ACC book-ACC read-CONJ eat-PST-DECL
 ‘John read the book and ate the meal.’
 b. *[[_{IP} John-i pap-ul_i chayk-ul ilk-ess-ko] [_{IP} t_i mek-ess]]-ta.
 John-NOM meal-ACC book-ACC read-PST-CONJ eat-PST-DECL
 ‘John read the book and ate the meal.’

Third, when the initial conjunct is untensed, negation at the end of the sentence may negate the initial conjunct as well as the final conjunct, but when tense is specified on the initial conjunct, only the second conjunct can be negated. According to Yoon, this contrast follows because *ani* takes scope over both conjuncts in the first case as in (23a), but in the second case it only scopes over the second conjunct as in (23b).

- (23) a. John-i [[_{VP} pap-ul mek-ko] [_{VP} kulus-ul chiwu-ci]] ani ha-yess-ta.
 John-NOM meal-ACC eat-CONJ dishes-ACC clean-CI NEG do-PST-DECL
 ‘John didn’t eat the meal and clean the dishes.’
 ‘John ate the meal but didn’t clean the dishes.’

- b. [[_{IP} John-i pap-ul mek-ess-ko] [_{IP} kulus-ul chiwu-ci ani ha-yess]]-ta.
 John-NOM meal-ACC eat-PST-CONJ dishes-ACC clean-CI NEG do-PST-DECL
 ‘John ate the meal but he didn’t clean the dishes.’

Kim (1995) however demonstrates that while coordination of two tensed clauses is a real coordination, coordination of an untensed conjunct with a tensed one is a case of a clausal adjunction. To begin, Yoon predicts (24) to be grammatical because for him, the coordinated conjuncts are VPs and *ani* is in the same clause as *amwuto* (‘anyone’). According to Kim, however, *amwuto pap-ul mek-ko* (‘anyone meal-acc eat-conj’) is an adjunct clause, and since there is no clause-mate negation within it, the NPI is not licensed.

- (24) *[[_{IP} Amwuto pap-ul mek-ko] John-i kulus-ul chiwu-ci ani ha-yess- ta.
 anyone meal-ACC eat-CONJ John-NOM dishes-ACC clean-CI NEG do-PST-DECL
 ‘No one ate the meal and John cleaned the dishes.’

Moreover, under the adjunction approach to untensed conjuncts, scrambling facts are accounted for without appealing to Saito’s Proper Binding Condition. Scrambling out of the tensed clause conjoined with an untensed clause is predicted to be possible because this is a case of local scrambling across an adjunct clause, as in (25)-(26).

- (25) Kulus-ul [_{IP} John-i pap-ul mek-ko] Mary-ka t_i chiwu-ess-ta.
 dishes-ACC John-NOM meal-ACC eat-CONJ Mary-NOM clean-PST-DECL
 ‘John ate the meal and Mary cleaned the dishes.’
- (26) John-i pap-ul [_{IP} *pro* chayk-ul ilk-ko] t_i mek-ess-ta.
 John-NOM meal-ACC book-ACC read-CONJ eat-PST-DECL
 ‘John read the book and ate the meal.’

The ambiguity concerning the scope of negation in (23) is also accounted for. Under the adjunction approach, the untensed conjunct is an IP adjunct containing a *pro* subject, as in (27). The scope ambiguity of negation can now be seen as a part of a general phenomenon having to do with the interpretation of matrix negation in complex sentences. Similar ambiguity arises in *John didn't eat the meal because he would have to clean the dishes*, or *It is not the case that John ate the meal and cleaned the dishes*.

- (27) John-i [_{IP} *pro* pap-ul mek-ko] kulus-ul chiwu-ci ani ha-yess-ta.
 John-NOM meal-ACC eat-CONJ dishes-ACC clean-CI NEG do-PST-DECL
 'John didn't eat the meal and clean the dishes.'
 'John ate the meal but didn't clean the dishes.'

With the untensed conjuncts as adjunct clauses, the verb in the tensed clause can combine with inflections through verb-raising as well as INFL-lowering. So, coordination of an untensed conjunct with a tensed one does not have any bearing on the issue of verb-raising.

In summary, it turns out that all of the data that has been used to argue for or against verb-movement have no bearing on the issue. This is because all of the data claimed to argue for verb-movement is consistent with a non-verb-movement grammar and all of the data claimed to argue for the lack of verb-movement is consistent with a verb-movement grammar.

3 Evidence from the Scope of Negation

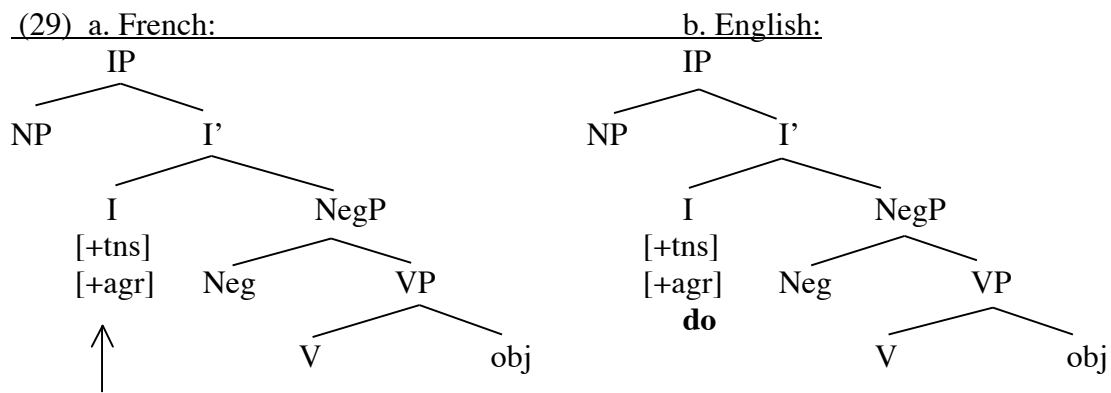
We will now consider one of the standard diagnostics for verb-movement, negation placement with respect to the verb, and how it applies to Korean. After a discussion

on the two types of negation in Korean and their syntactic status within the clause structure, we will establish that scope interactions between negation and argument QPs can be used as evidence for or against verb-raising.

3.1 Evidence from Negation

One of the standard types of evidence for verb-raising comes from negation (Pollock 1989). In French, the word order in which the finite verb precedes negation is taken as evidence that the verb moves to INFL. An example and the corresponding structure are given in (28a) and (29a). In contrast, English main verbs require *do*-support with negation as in (28b). This fact has been taken as evidence that the verb does not move to INFL in English as in (29b).

- (28) a. Jean (n')aime pas Marie. (French)
 Jean likes NEG Marie
 b. John does not like Mary. (English)



We can now ask if the position of the verb relative to negation could be informative in answering the question of whether Korean exhibits verb-raising. Korean has two forms of negation: a long form and a short one. Long negation is postverbal

and requires *ha*-support (30), which is equivalent to English *do*-support. In contrast, short negation is preverbal and does not require *ha*-support (31).

(30) Korean long-negation:

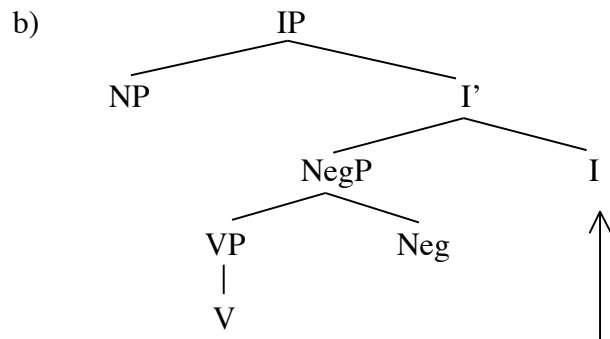
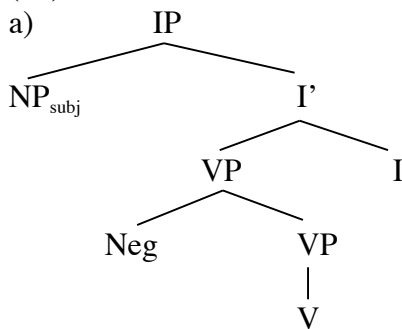
Toli-ka ttena-ci ani ha-yess-ta
 Toli-NOM leave-CI NEG do-PST-DECL
 'Toli didn't leave.'

(31) Korean short-negation:

Toli-ka an ttena-ss-ta
 Toli-NOM NEG leave-PST-DECL
 'Toli didnt' leave.'

The obligatory *ha*-support in sentences with long negation indicates that long negation is a head that projects a negation phrase (NegP) and blocks verb-raising. However, the existence of *ha*-support in sentences with the negative form *ani* does not tell us whether verb-raising is generally blocked. For example it is possible that verbs raise generally but fail to raise only when the head of NegP is filled. This leaves us with short negation. One possibility is that short negation has a different syntactic status from long negation, being a specifier or an adjunct, as illustrated in (32a). Alternatively, short negation might have the same syntactic status as long negation, being a head of NegP, as illustrated in (32b).

(32)



If (32a) is the correct structure, then we still don't know whether there is verb-raising.

If (32b) is the correct structure, then we can conclude that there is verb-raising, assuming that for some reason short negation, unlike its long counterpart, does not block verb-raising (or that verb-raising is optional, yielding short negation if raising applies and long-negation if it does not).

Unfortunately, we have reasons to believe that short negation is in a position distinct from long negation, with the representation (32a). Importantly, a sentence can contain both short and long negation as in (33), suggesting that (32a) is the correct representation in short negation.

- (33) Toli-ka maykcwu-lul an masi-ci ani ha-yess-ta
Toli-NOM beer-ACC NEG drink-CI NEG do-PST-DECL
'Toli didn't not drink beer.' (Toli drank beer)

However, even if (32a) is the right structure for short negation, we can make use of short negation to determine the height of the verb by exploring scope interactions with negation and quantified objects.

3.2 Exploring Scope Interactions between Negation and Object QPs

To motivate using scope interactions between negation and object QPs as a diagnostic for verb-raising, we present three background facts about Korean: frozen scope, object raising, and Neg-cliticization.

First, it has been widely observed that in Korean, as in Japanese, argument QPs exhibit frozen scope. That is, in a sentence with canonical SOV word order, with subject and object QPs, the only reading available is the one in which the subject scopes over the object, as in (34a). The inverse scope is possible only if the object

scrambles over the subject, as in (34b) (K.-W. Sohn 1995, S.-H. Ahn 1990, Y. Joo 1989, Hagstrom 1998).

- (34) a. Nwukwunka-ka manhun salam-ul piphanhay-ss-ta.
 someone-NOM many person-ACC criticize-PST-DECL
 ‘Someone criticized many people.’ (some>many, *many>some)
- b. [Manhun salam-ul]_i nwukwunka-ka t_i piphanhay-ss-ta.
 many person-Acc someone-NOM criticize-PST-DECL
 ‘Someone criticized many people.’ (some>many, many>some)

Second, some adverbs, such as *cal* (‘well’), must follow the object NP in transitive sentences. Assuming that this type of adverb is VP-adjoined, it provides support for object raising from a VP internal position to a functional projection higher in the clause structure (Hagstrom 1998, 2002).²

- (35) a. Toli-ka maykcwu-lul cal masi-n-ta. (S O Adv V)
 Toli-NOM beer-ACC well drink-PRES-DECL
 ‘Toli drinks beer well.’
- b. * Toli-ka cal maykcwu-lul masi-n-ta. (*S Adv O V)
 Toli-NOM well beer-ACC drink-PRES-DECL
 ‘Toli drinks beer well.’

Third, short negation has the morphosyntactic status of clitic, as in many Romance languages (Cinque 1999), and is treated as a unit with the verb in overt

² Adverbs such as *cal* are not clitics on the verb. For example, *cal* can be modified by or conjoined with another adverb, as in (i).

- (i) a. Toli-ka maykcwu-lul acwu cal masi-n-ta.
 Toli-NOM beer-ACC very well drink-PRES-DECL
 ‘Toli drinks beer very well.’
- b. Toli-ka maykcwu-lul cal kuliko cacwu masi-n-ta.
 Toli-NOM beer-ACC well and often drink-PRES-DECL
 ‘Toli drinks beer well and often.’

syntax. Short negation *an* must occur immediately before the verb in adult Korean. Nothing can intervene between short negation and the verb as in (36-37); and, in VP ellipsis contexts, the verb cannot be elided without short negation as in (38).

- (36) a. Toli-ka maykcwu-lul **an** masi-n-ta (S O Neg V)
 Toli-NOM beer-ACC NEG drink-PRES-DECL
 ‘Toli doesn’t drink beer.’
- b. * Toli-ka **an** maykcwu-lul masi-n-ta (*S Neg O V)
 Toli-NOM NEG beer-ACC drink-PRES-DECL
 ‘Toli doesn’t drink beer.’
- (37) a. Toli-ka maykcwu-lul **cal an** mas-in-ta (S O Adv Neg V)
 Toli-NOM beer-ACC well NEG drink-PRES-DECL
 ‘Toli doesn’t drink beer well.’
- b. * Toli-ka maykcwu-lul **an cal** mas-in-ta (*S O Neg Adv V)
 Toli-NOM beer-ACC NEG well drink-PRES-DECL
 ‘Toli doesn’t drink beer well.’
- (38) a. Toli-ka kwaca-lul ppali kuliko cake-lul chenchehi **an** mek-ess-ta.
 Toli-NOM cookie-ACC quickly and cake-ACC slowly NEG eat-PST-DECL
 ‘Toli didn’t eat cookies quickly and he didn’t eat cake slowly.’
- b. * Toli-ka kwaca-lul ppali **an** kuliko cake-lul chenchehi **an** mek-ess-ta.
 Toli-NOM cookie-ACC quickly NEG and cake-ACC slowly NEG eat-PST-DECL
 ‘Toli didn’t eat cookies quickly and he didn’t eat cake slowly.’

Because of this tight relationship between short negation and the verb, some researchers (Y.-K. No 1988, J.-B. Kim 2000) have argued that short negation is a prefixal bound morpheme on the verb and cannot host an independent syntactic projection. However, children (2-3 years of age) sometimes fail to put together short negation and the verb, as shown in (17) (K.-J. Hahn 1981; Y.-M. Cho and K.-S. Hong 1988; Y.-J. Kim 1997; Y.-K. Baek 1998; Hagstrom 2002).

(39) Sentences produced by 2-3 year-old Korean children:

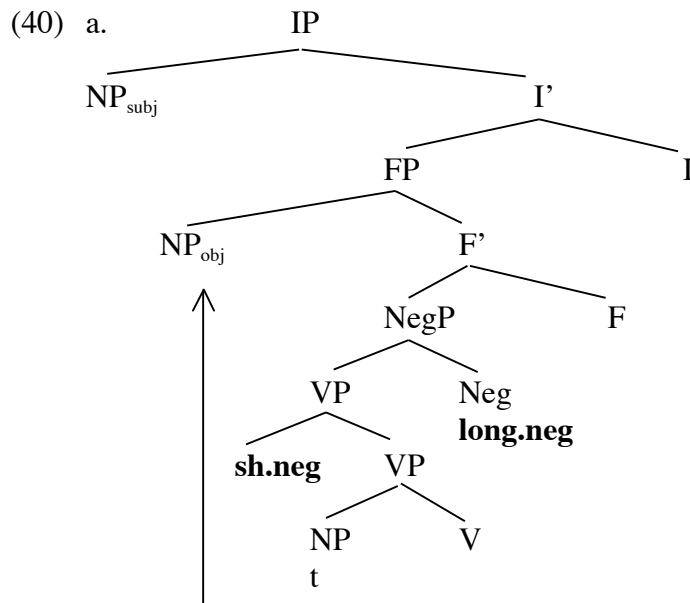
- a. Na **an** pap mek-e.
I NEG rice eat-DECL
'I will not eat rice.' (Y.-M. Cho and K.-S. Hong 1988)
- b. **An** mak uwl-e.
NEG much cry-DECL
'(I) do not cry much.' (Y.-M. Cho and K.-S. Hong 1998)
- c. **An** kyelan mek-e.
NEG egg eat-DECL
'(I) won't eat eggs.' (K.-J. Hahn 1981)
- d. **An** kkum kkwe-ese ...
NEG dream dream-because ...
'Because (I) did not dream ...' (Y.-J. Kim 1997)

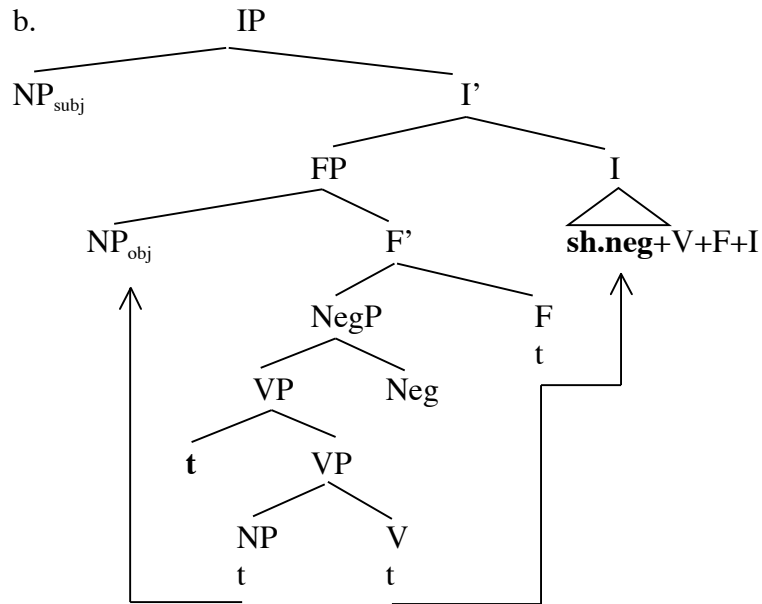
This type of acquisition data supports an analysis of short negation as an independent lexical item with a projection of its own. It suggests that the base position of short negation is to the left of the object, just as for VP-adjoined adverbs, and that children go through a stage in which they fail to cliticize short negation onto the verb (H. Han and M.-K. Park 1994).

Taken together, these facts suggest that scope facts in sentences containing both short negation and a quantified object NP could provide a clear test for the height of the verb. Given the scope freezing effect, the scope of an argument QP will be determined by its surface position, without recourse to QR or reconstruction. This then means that it is the position of negation in the clause structure that determines the relative scope of negation and an argument QP. Finally, given that objects obligatorily raise out of the VP and that short negation is a unit with the verb, the relative scope of negation and an object QP will tell us whether the verb has raised. If the verb raises, then negation (cliticized to the verb) will occur in a position higher than an object QP

and will therefore take scope over this QP. On the other hand, if the verb remains in VP, then negation will also remain in VP and the object QP will take scope over negation.

In order to make these predictions more precise, we postulate a clause structure for Korean as below. Long negation heads its own projection NegP, and short negation is adjoined to VP. The subject NP originates within VP and moves to [Spec,IP] for case and EPP reasons. The object NP also originates within VP but moves to a functional projection external to VP, presumably for case reasons. These are represented in (40a). Moreover, if the verb undergoes raising, then short negation would move along with the verb, as represented in (40b).





With the structures in (40a) and (40b), the following predictions clearly emerge:

(41) Predictions:

- a. Subject QPs will scope over NEG, independent of negation type.
- b. In short negation,
 - i) if there is V-raising, then NEG+V will occur in IP and so NEG will take scope over object QPs;
 - ii) if there is no V-raising, then NEG+V will occur inside VP and object QPs will scope over NEG.

Even given these clear predictions, however, a problem of data remains. Korean linguists cannot reach a consensus on what the scope facts are.

3.3 Conflicting Claims in the Literature

The scope judgments reported in the literature for sentences containing negation and quantified argument NPs often conflict with each other. While most authors agree that both types of negation can take narrow scope with respect to both subject and object

QPs, there is little agreement as to the availability of the wide scope reading of negation.

First, examining sentences with a subject-oriented adverbial QP *ta* ('all'), as in (42), J.-H. Suh (1989) and H.-H. Park (1998) report that while sentences with short negation only exhibit the 'all>neg' reading, sentences with long negation exhibit both the 'all>neg' and 'neg>all' readings. On the other hand, K. Lee (1979) and J.-B. Kim (2000) report that sentences with long or short negation allow both the 'all>neg' and 'neg>all' readings. Their judgments are summarized in Table (1).

(42) Subject-oriented adverbial QP:

- a. Ta an o-ass-ta.
all NEG come-PST-DECL
'All didn't come' (short negation)
- b. Ta o-ci ani ha-yess-ta.
all come-ci NEG do-PST-DECL
'All didn't come.' (long negation)

Table (1) Judgments:

	J.-H. Suh (1989), H.-H. Park (1998)			K. Lee (1989) J.-B. Kim (2000)	
	all>neg	neg>all		all>neg	neg>all
Short neg	Yes	No		Yes	Yes
Long neg	Yes	Yes		Yes	Yes

Second, using examples with an object-oriented adverbial QP as in (43), C.-H. Cho (1975) reports that while sentences with long negation are ambiguous between the 'two>neg' and 'neg>two' readings, sentences with short negation only have the 'two>neg' reading. But S.-C. Song (1982) reports that sentences with long and short negation are ambiguous between 'two>neg' and 'neg>two' readings. These judgments are summarized in Table (2).

(43) Object-oriented adverbial QP:

- a. John-i sakwa-lul twu kay an mek-ess-ta.
 John-NOM apple-ACC two piece NEG eat-PST-DECL
 ‘John didn’t eat two apples.’ (short negation)
- b. John-i sakwa-lul twu kay mek-ci ani ha-yess-ta.
 John-NOM apple-ACC two piece eat-CI NEG do-PST-DECL
 ‘John didn’t eat two apples.’ (long negation)

Table (2) Judgments:

	C.-H. Cho (1975)			S.-C. Song (1982)	
	two>neg	neg>two		two>neg	neg>two
Short neg	Yes	No		Yes	Yes
Long neg	Yes	Yes		Yes	Yes

Third, based on examples with a universal quantifier in object position as in (44), Hagstrom (1998) and J.-H. Suh report that whereas sentences with short negation only have the ‘every>neg’ reading, sentences with long negation have both the ‘every>neg’ and ‘neg>every’ readings. But Y.-K. Baek (1998) and J.-B. Kim (2000) report that sentences with either short or long negation allow both the ‘every>neg’ and ‘neg>every’ readings. Their judgments are summarized in Table (3).

(44) Universal quantifier in object position:

- a. John-i motun chayk-ul an ilk-ess ta.
 John-NOM every book-ACC NEG read-PST-DECL
 ‘John didn’t read every book.’ (short negation)
- b. John-i motun chayk-ul ilk-ci ani ha-yess-ta.
 John-NOM every book-ACC read-CI NEG do-PST-DECL
 ‘John didn’t read every book.’ (long negation)

Table (3) Judgments:

	Hagstrom (1998); J.-H. Suh (1989)			Y.-K Baek (1998); J.-B. Kim (2000)	
	every>neg	neg>every		every>neg	neg>every
Short Neg	Yes	No		Yes	Yes
Long Neg	Yes	Yes		Yes	Yes

Lastly, using examples with a universal quantifier in subject position as in (45), Hagstrom (1998) reports that sentences with long negation are ambiguous between ‘every>neg’ and ‘neg>every’ readings, but sentences with short negation only have the ‘every>neg’ reading. Y.-K. Baek (1998) and J.-B. Kim (2000) report that sentences with short negation as well as those with long negation are ambiguous. Yet another view is reported in J.-H. Suh (1989). She reports that sentences with short negation and also those with long negation can only have the ‘every>neg’ reading. These judgments are summarized in Table (4).

(45) Universal quantifier in subject position:

- a. Motun salam-i yeki-e an o-ass-ta.
every person-NOM here-to NEG come-PST-DECL
‘Every person didn’t come here.’ (short negation)
- b. Motun salam-i yeki-e o-ci an ha-yess-ta.
every person-NOM here-to come-ci NEG do-PST-DECL
‘Every person didn’t come here.’ (long negation)

Table (4) Judgments:

Hagstrom (1998)			Y.-K Baek (1998), J.-B. Kim (2000)		
	every>neg	neg>every		every>neg	neg>every
short neg	Yes	No		Yes	Yes
long neg	Yes	Yes		Yes	Yes

J.-H. Suh (1989)		
	every>neg	neg>every
short neg	Yes	No
long neg	Yes	No

Given the conflicting nature of the scope judgments available in the literature on Korean, one would be hard pressed to draw any firm conclusions regarding verb-raising. Why then do Korean linguists seem unable to agree on these facts? One possibility is that the disagreement arises from a methodological problem. Perhaps

some speakers are better able than others to imagine the contexts that make certain readings available. Or, perhaps some speakers are influenced by their knowledge of logic or of other languages in making grammaticality judgments. A third possibility is that the variability found among speakers is not noise in the collection method but rather reflects a genuine fact about Korean speakers. In particular, it is possible that different speakers have different grammars with respect to verb-movement, leading in turn to different scope judgments in sentences involving the relevant scope interactions. In the next section, we address this issue by controlling the context of presentation so as to yield what we believe are judgments that clearly illustrate people's grammars.

4 Experimental Investigations

So far, we have seen that even though scope interactions between negation and quantified argument NPs should provide a clear test for verb-raising, conflicting scope judgments reported in the literature make it impossible for us to draw any firm conclusions. One suspicion that arises at this point is that the disagreement in the judgments may have been caused by the methodology that was used to elicit judgments from the native speakers: namely that insufficient discourse context may have limited the availability of possible readings for some speakers. To avoid this problem, we obtained scope judgments from speakers of Korean using a psycholinguistic technique known as the Truth Value Judgment Task (TVJT) (Crain and Thornton 1998). Because this method reduces the role of performance factors in accessing speakers' intuitions and holds discourse context constant (see Crain and Thornton 1998, and Musolino and Lidz 2000 for further discussion of the properties of

the task), experimentation using this method should provide data that accurately reflects the grammars of the speakers.

The TVJT involves two experimenters. One experimenter acts out short scenarios in front of the subject using small toys and props. The other experimenter plays the role of a puppet (e.g., Mickey Mouse) who watches the scenario alongside the subject. At the end of the story, the puppet makes a statement about what he thinks happened in the story. The subject's task is to determine whether the puppet told the truth or not.

For instance, to test how speakers of English would interpret a negative sentence with a quantified subject such as *Every horse didn't jump over the fence*, an experimenter enacts a scenario, using three toy horses and a toy fence, in which two of the horses jump over the fence, but one horse does not. In this situation, notice that *Every horse didn't jump over the fence* is true on the interpretation where negation takes scope over the subject QP (i.e. not>every) but false if the subject QP is interpreted outside the scope of negation (i.e. every>not). A detailed context for this scenario is given in (46), and a screen shot of the resulting scenario is given in Figure 1.

(46) Example context:

One day three horses were playing in the field and they decided to jump over some stuff. There was a house and a fence in the yard. They decided that the house was too high to jump over and so they decided to try jumping over the fence. Two of them were very excited about jumping over the fence but the third wasn't sure whether he could. The first one jumped over the fence. "Hey, that was fun," he said. "You try it." Then the second horse also jumped over the fence. The third one came up to fence and considered jumping but he said that he had hurt his foot the day before and so decided not to jump.



$\text{neg} > \square = \text{True}$ $\square > \text{neg} = \text{False}$

Figure 1: Screen shot of a scenario

Another experimenter holds a Mickey Mouse puppet, acting as if he is watching the enacted scenario. Mickey, who is asked to describe what happened, then makes the following statement:

(47) Puppet statement.

“Hmm. That was an interesting story about horses playing in the field. I can tell you something about the story. **Every horse didn’t jump over the fence.** Am I right?”

The subject’s task is to determine whether Mickey’s statement is true or false. If the subject judges the statement to be true, then we can conclude that the grammar makes available to him/her the reading in which negation scopes over the quantified NP. If the subject judges the statement to be false, then we can conclude that only the narrow scope reading of negation is available to the subject, and thus that the grammar does not generate the other reading. An important part of the reasoning behind this method is that subjects will always assent when the experimenter says at least one thing that is true (Crain and Thornton 1998). In other words, the method relies on listeners giving speakers the benefit of the doubt. Hence, if anything that the speaker says is true, then subjects respond by saying that the speaker did in fact speak truthfully. Thus, when

we present sentences that are true on one reading but false on another and the subjects reject the statement as false, we conclude that the other reading is not available.

The TVJT method provides rich discourse contexts, eliminating the role of performance factors and controlling for discourse factors in subjects' responses. The method has been shown to work in several languages (Lidz and Musolino 2002, Papafragou and Musolino 2003, *inter alia*), and to work with both adults and children as young as 4 years old (Crain and McKee 1985, Crain and Thornton 1998, Lidz and Musolino 2002).

Our experiments were designed to address the following three questions: (i) determining experimentally what the facts are concerning adult Korean speakers' scope judgments on sentences containing negation and quantified argument NPs; (ii) determining whether Korean has verb-raising; (iii) testing predictions regarding children's grammar made on the basis of the data we obtained from adults.

In order to address these questions, we conducted two experiments, one with adults and the other with 4-year-olds.

4.1 Experiment 1

4.1.1 Participants

We tested 160 adult speakers of Korean, all undergraduate and graduate students at universities in Seoul, Korea.

4.1.2 Experimental Design

For adults, we tested 3 factors with 2 levels each: scope (neg>□ vs. □>neg) x negation (Long vs. Short) x grammatical function (Subject QP vs. Object QP). The experiment

was thus divided into 8 different conditions, each condition testing for the $\text{neg} > \square$ or $\square > \text{neg}$ reading in sentences containing long or short negation, and either a subject QP or an object QP. For each condition, we tested 20 participants. The design is summarized in Table (5).

Since the puppet's statements on critical trials are potentially ambiguous, we chose to treat scope condition as a between subjects factor, instead of a within subjects factor, in order to avoid potential contaminating effects between the two possible readings. That is, once participants become aware of one of the possible interpretations for these statements, they may find it difficult to later assign a similar statement a different interpretation. In other words, the initial interpretation that participants assign to statements containing a QP and negation may influence the way they interpret subsequent statements containing the same elements.

Table (5) Design of experiment on adults:

2x2x2 design: *Negation type* x *QP position* x *Scope*
(short vs. long) (subj. vs. obj.) ($\text{neg} > \square$ vs. $\square > \text{neg}$)

GF	Scope	Short negation	Long negation
Subject QP	$\text{neg} > \square$	n=20	n=20
	$\square > \text{neg}$	n=20	n=20
Object QP	$\text{neg} > \square$	n=20	n=20
	$\square > \text{neg}$	n=20	n=20

4.1.3 Materials

We constructed two versions of each scenario, one version testing the $\text{neg} > \square$ reading and the other version testing the $\square > \text{neg}$ reading. There were four different types of test sentence for each reading: (i) subject QP and long negation as in (48a), (ii) subject QP

and short negation as in (48b), (iii) object QP and long negation as in (49a), and (iv) object QP and short negation as in (49b).³

(48) Subject QPs

- a. Motun mal-i wultali-lul num-ci **ani** ha-yess-ta.
 Every horse-NOM fence-ACC jump.over-CI **NEG** do-PST-DECL
 ‘Every horse didn’t jump over the fence.’ (long negation)
- b. Motun mal-i wultali-lul **an** num-ess-ta.
 Every horse-NOM fence-ACC **NEG** jump.over-PST-DECL
 ‘Every horse didn’t jump over the fence.’ (short negation)

(49) Object QPs

- a. Kwuki monste-ka motun kwuki-lul mek-ci **ani** ha-yess-ta.
 Cookie Monster-NOM every cookie-ACC eat-CI **NEG** do-PST-DECL
 ‘Cookie monster didn’t eat every cookie.’ (long negation)
- b. Kwuki monste-ka motun kwuki-lul **an** mek-ess-ta.
 Cookie Monster-NOM every cookie-ACC **NEG** eat-PST-DECL
 ‘Cookie monster didn’t eat every cookie.’ (short negation)

In the scenario that tests neg>□ reading on (48a) and (48b), three horses are playing together. Two horses jump over the fence, but the third one doesn’t. At the end of the story, Mickey Mouse says in Korean “I know what happened” and states either (48a)

³ For many Korean speakers, a more natural way of expressing universal quantification is to use post-nominal quantifiers like *ta* or *motwu*. The problem with these quantifiers for the present purposes is that syntactically they are floating adverbial quantifiers and that they do not form a constituent with the nouns they modify. For instance, an adverb can intervene between a post-nominal quantifier and the noun it modifies, as in (i). This means that the quantifier can stay low within VP, below negation, and so the neg>all reading, if available, could not be attributed to verb-raising. For this reason, we chose to use pre-nominal quantifiers in our test sentences, which are in constituent with the nouns they modify.

- (i) Kwuki monste-ka kwuki-lul tahaynghito ta an mek-ess-ta.
 Cookie Monster-NOM cookie-ACC fortunately all **NEG** eat-PST-DECL
 ‘Cookie monster didn’t eat every cookie fortunately.’

or (48b), depending on what condition is being tested. In the scenario that tests $\neg > \neg$ reading, none of the horses jump over the fence. Mickey Mouse then states either (48a) or (48b).⁴

In the scenario that tests $\neg > \neg$ on (49a) and (49b), Cookie Monster is given three cookies but only eats two of them (i.e., not all of them). And then Mickey Mouse states (49a) or (49b) depending on the condition of the experiment. In the scenario that tests $\neg > \neg$ reading, Cookie Monster eats none of the cookies, and then Mickey Mouse states (49a) or (49b).

Each subject was given four test trials. The statements made by Mickey Mouse in the 8 different conditions are given in appendix 1. In addition to the four test trials, each participant was given four filler trials: two testing the comprehension of negation, and two testing the comprehension of quantified NPs. The purpose of the filler trials is to separately control for participants' knowledge of the meaning of negation and universally quantified NPs, the two linguistic elements involved in the meaning of the test sentences. Filler sentences containing long negation were given to participants in Short negation condition, and those containing short negation were given to participants in Long negation condition. By using the opposite negation form in the filler items and the test items, we add some variability to the materials, thereby making it harder for the participants to guess the purpose of the experiment. Similarly, filler sentences containing subject QPs were given to participants in Object QP condition, and those containing object QPs were given to participants in Subject QP condition. As with negation, inclusion of quantifiers with the opposite grammatical

⁴ The experimenter was instructed to say the test sentence in a way that made it true, thus controlling for any potentially contaminating effects of prosody.

function from the test items in the fillers helped to mask the purpose of the experiment. The filler statements made by Mickey Mouse in each condition are given in appendix 2. We set up the scenarios for the filler trials such that the correct answer for the filler statements was ‘True’ in Subject QP - Short neg - neg>□ and Object QP - Short neg - neg>□ conditions. This was because we expected that participants in these conditions were likely to say that the test items were false. Thus, including these fillers ensured that participants would not think that the only possible answer in the experiment is ‘False.’ The fillers in the other six conditions were designed to give the answer ‘False.’

4.1.4 Procedure

Adult subjects were shown a videotaped version of the scenarios described in subsection 4.1.3. They were first introduced to the task with two practice trials, one in which Mickey Mouse’s statement was true and one in which it was false. They then were shown four test trials and four filler trials in pseudorandom order. They were given a score sheet and were instructed to indicate, for each story, whether Mickey Mouse spoke truthfully. They were asked to provide a brief justification for their answers. Adult subjects were tested in groups of 10 to 20 in classrooms.

4.1.5 Results

For each condition, our dependent measure was the proportion of ‘yes’ responses to Mickey’s statements. These data are given in Table (6) and shown graphically in figures 2 and 3.

Table (6): Mean Percent Acceptances by Condition: Adults

GF	Scope	Short negation	Long negation
Subject QP	neg>□	4%	19%
	□>neg	100%	100%
Object QP	neg>□	37%	46%
	□>neg	98%	98%

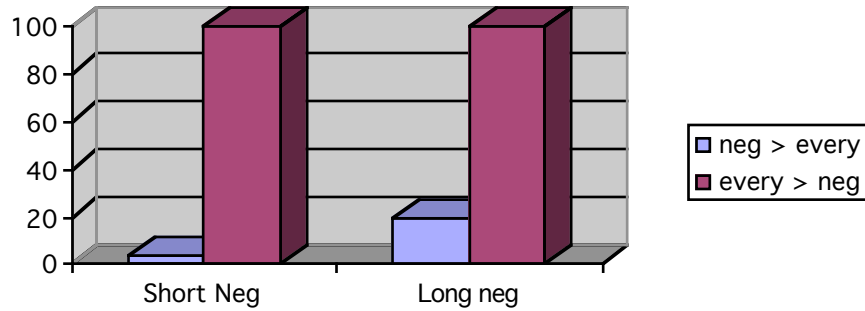


Figure 2: Mean Percent Acceptances in Subject Condition: Adults

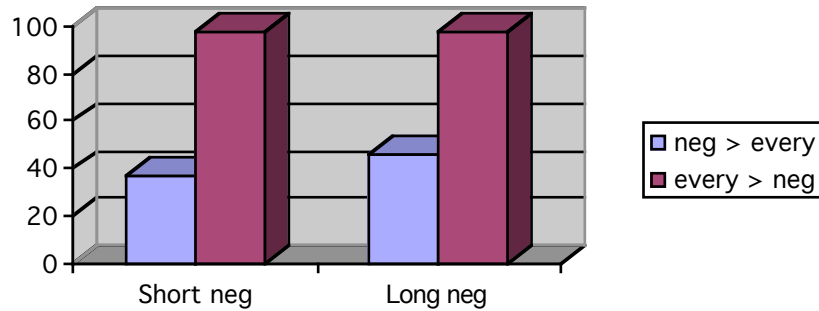


Figure 3: Mean Percent Acceptances in Object Condition: Adults

The proportion of ‘yes’ responses were entered into an analysis of variance (ANOVA), which revealed the following effects. First, we found a main effect of interpretation ($F(1,152)= 267.44, p<.0001$). That is, independent of negation type or grammatical function, speakers were more likely to accept the $\square>\text{neg}$ reading than the $\text{neg}>\square$ reading. Second, we found a main effect of grammatical function ($F(1,152)=11.64,$

$p < .0008$) and an interaction between interpretation and grammatical function ($F(1,152)=13.91, p < .0003$). That is, independent of negation type, speakers were significantly more likely to accept the $\text{neg} > \square$ reading on an object QP than they were on a subject QP. Importantly, whereas the rate of acceptances on the $\text{neg} > \square$ reading was higher in the object condition than in the subject condition, over 50% of subjects still did not accept this interpretation in the object condition.⁵

This last result is of particular interest. Figure 4 divides the subjects into groups based on their rate of acceptance of the sentences presented in the $\text{neg} > \square$ context. What we see there is that most subjects either accepted all of these items or rejected all of these items, indicating that our population is divided into two groups: those that accept wide scope negation relative to an object QP and those that do not.

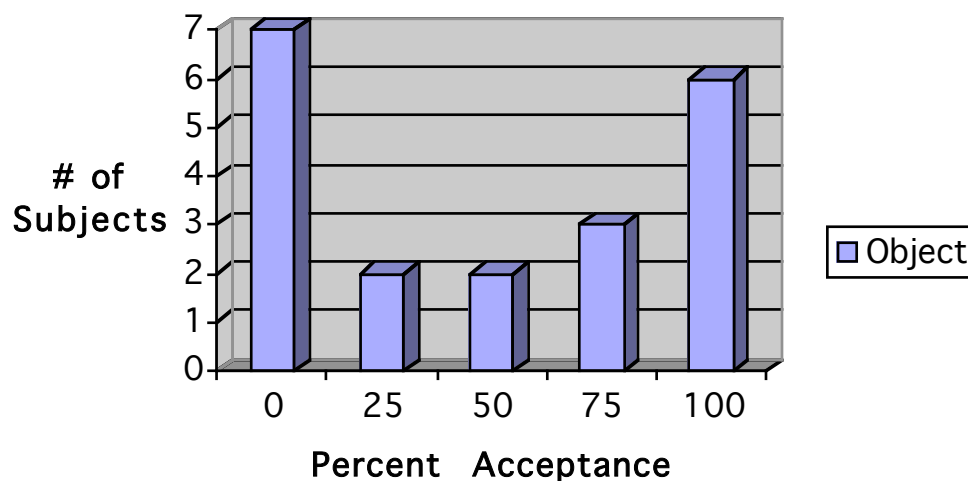


Figure 4: # of Subjects Accepting $\text{Neg} > \text{Every}$

4.1.6 Discussion

Recall our predictions stated in (41), repeated here as (50).

⁵ Participants were near perfect on filler items, indicating that they had no difficulty with the task or with negation or universal quantification in isolation.

(50) Predictions:

- a. Subject QPs will scope over NEG, independent of negation type.
- b. In short-negation,
 - i) if there is V-raising, then NEG+V will occur in IP and so NEG will take scope over object QPs;
 - ii) if there is no V-raising, then NEG+V will occur inside VP and object QPs will scope over NEG.

Prediction (50a) is borne out by our findings. Participants uniformly accepted the $\square > \text{neg}$ reading for subject QPs, independent of negation type. Importantly, our data indicate that any variability found among Korean linguists regarding the interpretation of subject QPs with respect to negation must represent an artifact of data collection. Our participants virtually never accepted the $\text{neg} > \square$ interpretation for subject QPs and always accepted the $\square > \text{neg}$ interpretation. Furthermore, these data lend support to the reasoning by which we established our predictions. We showed that, given three basic facts (frozen scope, obligatory object raising, and the clitic status of negation), both a verb-raising and a INFL-lowering grammar would predict that the subject obligatorily takes scope over negation. The fact that this prediction was borne out indicates that our use of scope interactions between the quantificational NPs and negation is appropriate for examining the height of the verb.

Prediction (50b), however, is the crucial piece of the puzzle. It was here that we would be able to tell the difference between a verb-raising and a non-verb-raising grammar. What we found was that only about half of our participants accepted the $\text{neg} > \square$ interpretation in which negation takes scope over the object QP. Further, this split was also found in $\text{neg} > \square$ interpretation with long negation and an object QP.

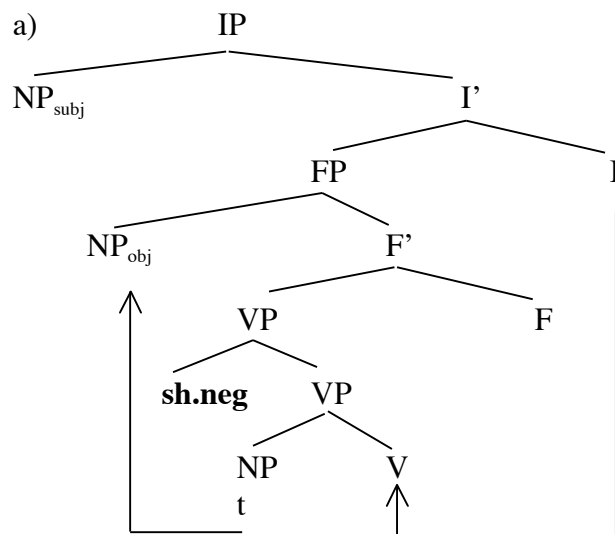
The bimodal distribution in acceptances of the reading for object QPs shows that there is a split in the population: only about half the people allow negation to scope over an object QP, regardless of negation type. In this case, we can conclude that the literature on Korean scope judgments for object QPs reflects a real variability in the population of Korean speakers. The scope judgments that we elicited within rich discourse contexts showed the same kind of disagreement as is attested in the literature.

The split in the population can mean only one thing: there is a split in the grammar. That is, half of the population has acquired an INFL-lowering grammar and half of the population has acquired a verb-raising grammar.⁶ The population that has acquired INFL-lowering grammar does not generate *neg>Q* reading on an object QP because the grammar only generates the structure in which the object c-commands negation, as represented by Grammar A in (51). In Grammar A, sentences with short negation have cliticization of short negation and INFL-lowering to V, and sentences with long negation have cliticization of long negation and INFL-lowering to *ha*. But the population that has acquired a verb-raising grammar generates the *neg>Q* reading on an object QP because the grammar generates the structure in which negation c-commands the object, as represented by Grammar B in (52). In Grammar B, sentences with short negation have cliticization of short negation to V and verb-raising to INFL,

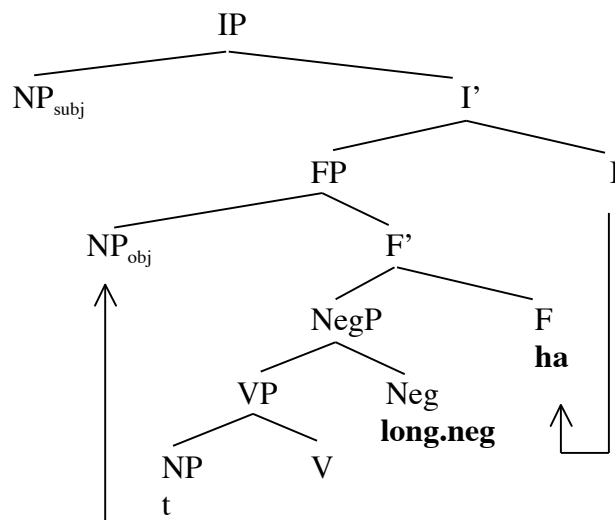
⁶ Note that the *Q>neg* reading entails the *neg>Q* reading. Thus, the fact that nearly 100% of our participants accepted the *Q>neg* reading in the object condition follows from the fact that this reading is consistent with either grammar. Those people with an INFL-lowering grammar will generate the *Q>neg* reading only. Those people with a verb-raising grammar will say that the puppet spoke truthfully in the *Q>neg* conditions because these conditions are entailed by the *neg>Q* reading generated by their grammars.

and sentences with long negation have cliticization of long negation to *ha* and raising of *ha* to INFL.

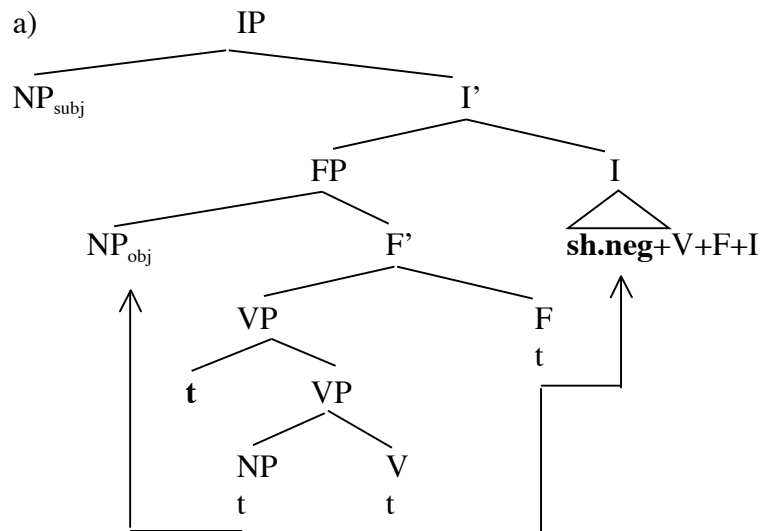
(51) Grammar A: INFL lowers to V; Short neg cliticizes to V; Object scopes over short neg.



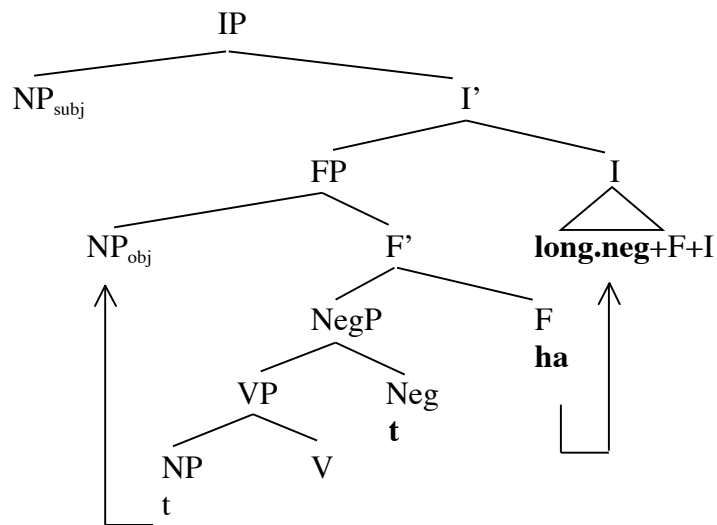
b) INFL lowers to *ha*; Long neg cliticizes to *ha*; Object scopes over long neg.



(52) Grammar B: Short neg cliticizes to V; V raises to INFL; Short neg scopes over object.



b) Long neg cliticizes to *ha*; *ha* raises to INFL; Long neg scopes over object.



Finally, if our two-grammar hypothesis is correct, then it predicts that we will find the same split in the population among learners of Korean. If the split in the

population derives from the fact that speakers are rarely exposed to sentences involving negation and an object QP in situations that make it clear which interpretation is intended, then we should expect to find roughly the same split in the population from generation to generation, with speakers choosing either verb-raising or INFL-lowering basically by chance. Our results from 4 year-old children verify this prediction. Just like adults, children accepted the $\text{neg} > \square$ reading only about half the time. And crucially, just like the adult data, the child data shows a bimodal distribution of acceptances of $\text{neg} > \square$ reading.

4.2 Experiment 2

4.2.1 Participants

We tested 60 4-year-old Korean children between the ages of 4;0 and 4;11 (mean 4;5), recruited from preschools in Korea. We chose 4-year-olds because children at this age are old enough to have mastered both negation forms (H.-H. Park 1988), and are cross-linguistically shown to be able to handle the demands of the task (Musolino et al. 2000 for English; Lidz and Musolino 2002 for English and Kannada).

4.2.2 Experimental Design

We tested 2 factors with 2 levels each: scope ($\text{neg} > \square$ vs. $\square > \text{neg}$) x negation (Long vs. Short). All the tests were done on sentences with object QPs. Because the object conditions are the ones that are potentially informative about the height of the verb, we tested only these. The experiment was thus divided into 4 different conditions, each condition testing for the $\text{neg} > \square$ or the $\square > \text{neg}$ reading in sentences containing object QP, and long or short negation. For each condition, 15 children were tested. The

design is summarized in Table (7).

Table (7) Design of experiment on children:

2x2 design: *Negation type* x *Scope*
 (short vs. long) (neg>□ vs. □>neg)

GF	Scope	Short negation	Long negation
Object QP	neg>□	n=15	n=15
	□>neg	n=15	n=15

4.2.3 Materials

The test materials were identical to those in experiment 1 with the exception that the subject QP condition was excluded from the design.

4.2.4 Procedure

Children were tested individually in a quiet room away from the class and all the scenarios were acted out in front of them by an experimenter using small toys and props. As with adults, children were introduced to the task with two practice trials followed by four test and four filler trials in pseudorandom order. The children's responses were recorded on a score sheet by the experimenter. The experimenter also asked the children why s/he answered that Mickey was right or wrong, and recorded their responses.

4.2.5 Results

The mean percent acceptances by condition for object QPs are summarized in Table (8), and the graphical representation is given in Figure 4.

Table (8): Mean Percent Acceptances by Condition for Object QPs: Children

Scope	Short negation	Long negation
neg>□	36.67	33.33
□>neg	81.67	86.67

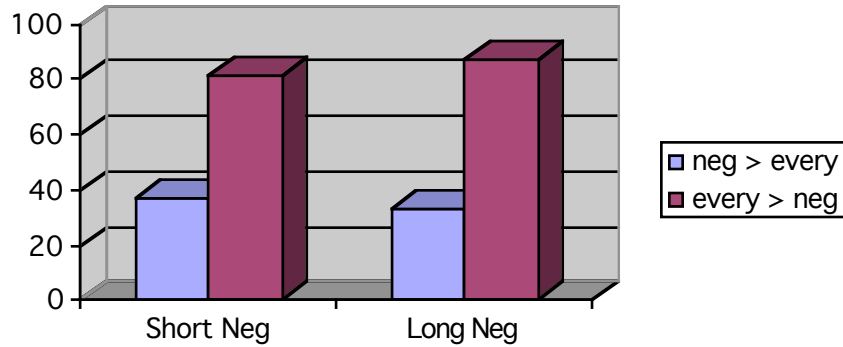


Figure 4: Mean Percent Acceptances in Object Condition: Children

Just like adults, children were more likely to accept □>neg reading than neg>□ reading, regardless of negation type ($F(1, 56)=20.09, p < .0001$). In □>neg condition, children accepted 81.67% on short negation and 86.67% on long negation, whereas in neg>□ condition, they accepted 36.7% and 33.33% on short and long negation respectively. Further, like adults, between one third and one half of the children accepted neg>□ reading on object QP.⁷

Also like adults, children's scores were bimodally distributed. That is, each child generally gave the same answer on all trials. Thus the 33.33% acceptance rate for the neg>□ reading in short negation derives from 33.33% of the children accepting the neg>□ reading and not from each child accepting it 33% of the time. That is, in short

⁷ Like adults, child participants were near perfect on filler items, indicating that they had no difficulty with the task or with negation or universal quantification in isolation.

negation, 9 children never accepted the neg> reading, 1 child accepted it 50% of the time and 5 children always accepted it. This finding supports our hypothesis that there are two grammars of Korean active in the population of Korean speakers: one grammar with verb-raising and one without.

5 General Discussion

The results of our experiments with adults and with children indicate that scope interactions between negation and quantified NPs are informative about the grammar of verb-movement in Korean. More specifically, these data indicate that there are two grammars of Korean verb-movement active in the population. We have argued that the existence of two populations follows from the poverty of the stimulus. Even though the range of possible verb-movement grammars is restricted by UG, the data that learners of Korean are exposed to is equally consistent with either grammar. Given that there is no basis on which to make a choice between a verb-raising grammar and an INFL-lowering grammar, Korean learners must choose at random. This results in roughly half the population acquiring one grammar and roughly half acquiring the other. This conclusion supports claims from the diachronic syntax literature (Kroch 1989, Pintzuk 1991, Santorini 1992, Taylor 1994) that even given the restricted hypothesis space determined by UG, insufficient input can lead to distinct grammars in a single population. The general model under consideration here is one in which all language acquisition involves grammar competition (Kroch 1989, Yang 2000, Roeper 2002; cf. Chomsky 1981, 1986). Under this approach, learners consider multiple grammars simultaneously, with language acquisition representing the exclusion of alternatives and the settling on a single grammar.

It is important to observe that the two-grammar result in Korean is not a direct consequence of the SOV nature of the language. It is possible for an SOV language to be unambiguously verb-raising or INFL-lowering. It is also not the case that children learning any SOV language will be bimodally distributed in their responses in a TVJT examining the scope of an object QP with respect to negation. For example, Lidz and Musolino (2002) examined the scope of object quantifiers with respect to negation in English (SVO) and Kannada (SOV). Whereas adults in both languages allow either scope, children in both languages display a strong preference for the surface scope reading. Although Kannada is an SOV language, we do not find any evidence of a split in the population with respect to verb-raising. This result may derive from several factors. First, the scope of an object QP with respect to negation is generally determined by syntactic position (Lidz 1999, 2003)⁸:

- (53) a. naanu cheenagi eradu pustaka ood-al-illa
 I-NOM well two book read-INF-NEG
 'It's not the case that I enjoyed reading two books.'
- b. naanu eradu pustaka cheenagi ood-al-illa
 I-NOM two book well read-INF-NEG
 'There are two books that I didn't enjoy reading.'

⁸ Note that syntactic position determines scope only for object NPs that are not morphologically casemarked. Casemarked object NPs take wide scope independent of syntactic position:

- (i) naanu cheenagi pustaka-vannu ood-al-illa
 I well book-ACC read-INF-NEG
 'There is a book that I didn't enjoy reading.'
- (ii) naanu pustaka-vannu cheenagi ood-al-illa
 I book-ACC well read-INF-NEG
 'There is a book that I didn't enjoy reading.'

See Lidz (1999, 2003) for discussion.

In (53a), the object is inside VP (below the VP adverb) and is only interpretable as within the scope of negation. In (53b), the object has raised out of VP and only takes scope over negation. Because Kannada, unlike Korean, allows its object NPs to occur both inside and outside of VP, the scope of an object NP with respect to negation is uninformative about the height of the verb.

Second, the fact that Kannada verbs typically inflect for tense and agreement (54a), but fail to do so in the presence of negation (54b) suggests that Kannada is a verb-raising language and that raising is blocked by negation.

- (54) a. naanu pustaka ood-id-e
 I book read-PST-1S
 ‘I read a book.’
- b. naanu pustaka ood-al-illa
 I book read-INF-NEG
 ‘I read a book.’

This observation by itself may be a sufficient cue for learners to determine that Kannada has a verb-raising grammar.

Third, Kannada exhibits a rule of emphatic verb formation that also supports a verb-raising analysis. In this construction, a verb occurs in its past participle form, followed by the emphatic morpheme, the verb root (repeated), tense and agreement (Aronoff and Sridhar 1984, Amritavalli 1998). This is illustrated in (55):

- (55) a. bar-utt-aane
 come-NPST-3SM
 ‘He comes.’
- b. band-ee-bar-utt-aane
 come.PP-EMPH-come-NPST-3SM
 ‘He will too come.’

A straightforward analysis of this construction is one in which the verb raises to INFL, but must be pronounced both within VP to host the emphatic clitic and in INFL in order to host the tense and agreement morphology. This analysis is supported, with the additional assumption that negation blocks verb-raising, by negative emphatics. Here, the verb does not repeat:

- (56) band-ee-illa
come.PP-EMPH-NEG
'He DID NOT come.'

The contrast between (55) and (56) may also serve as a cue to the verb-raising status of Kannada, helping learners to uncover the correct grammar despite the SOV nature of the language.

To conclude, although it is true that verb-raising may be harder to detect in SOV languages than in other languages, it is not the case that no cues exist. Rather, a host of other unrelated properties make verb-raising especially hard to detect in Korean. Consequently, we find that learners are unable to determine the correct grammar and hence choose essentially at random from two possible options, both of which are fully consistent with the language data they are exposed to. In sum, even learners with the highly restricted hypothesis space provided by universal grammar may have difficulty setting certain parameters on the basis of positive evidence. In such cases, we expect, and indeed we find, that learners will choose a parameter setting at random.

Appendix 1

(57) Subject QP - Short neg - neg>[]; Subject QP - Short neg - []>neg

- a. Motun mal-i wultali-lul an nem-ess-ta.
every horse-NOM fence-ACC NEG jump.over-PST-DECL
'Every horse didn't jump over the fence.'
- b. Motun smef-ka koyangi-lul an sa-ss-ta.
every smurf-NOM cat-ACC NEG buy- PST-DECL
'Every smurf didn't buy a cat.'
- c. Motun yeca ai-ka toliki-lul an tha-ss-ta.
every female kid-NOM merry-go-round-ACC NEG ride-PST-DECL
'Every girl didn't ride on the merry-go-round.'
- d. Motun namcatul-i konglyong-ul an manci-ess-ta.
every men-NOM dinosaur-ACC NEG pet-PAST-DECL
'Every man didn't pet the dinosaur.'

(58) Subject QP - Long neg - neg>[]; Subject QP - Long neg - []>neg

- a. Motun mal-i wultali-lul nem-ci ani ha-yess-ta.
every horse-NOM fence-ACC jump.over-CI NEG do-PST-DECL
'Every horse didn't jump over the fence.'
- b. Motun smef-ka koyangi-lulsa-ci ani ha-yess-ta.
every smurf-NOM cat-ACC buy-CI NEG do- PST-DECL
'Every smurf didn't buy a cat.'
- c. Motun yeca ai-ka toliki-lul tha-ciani ha-yess-ta.
every female kid-NOM merry-go-round-ACC ride-CI NEG do-PST-DECL
'Every girl didn't ride on the merry-go-round.'
- d. Motun namcatul-i konglyong-ul manic-ci ani ha-yess-ta.
every men-NOM dinosaur-ACC pet-CI NEG do-PAST-DECL
'Every man didn't pet the dinosaur.'

(59) Object QP - Short neg - neg>[]; Object QP - Short neg - []>neg

- a. Kupa-ka motun panci-lul an sa-ss-ta.
Goofy-NOM every ring-ACC NEG buy-PST-DECL
'Goofy didn't buy every ring.'
- b. Cooki-monster-ka motun cooky-lul an mek-ess-ta.
Cookie Monster-Nom every cookie-ACC NEG eat-PST-DECL
'Cookie Monster didn't eat every cookie.'

- c. Swuntoli-ka motun catongcha-lul an ssis-ess-ta.
Swuntoli-NOM every car-ACC NEG wash-PST-DECL
'Swuntoli didn't wash every car.'
- d. Ttungpo-ka motun khokkili-lul thakca wuy-ey an olli-ess-ta.
fat.man-NOM every elephant-ACC table top-at NEG put-PST-DECL
'The fat man didn't put every elephant on the table.'

(60) Object QP - Long neg - neg>□; Object QP - Long neg - □>neg

- a. Kupi-ka motun panci-lul sa-ci ani ha-yess-ta.
Goofy-NOM every ring-ACC buy-CI NEG do-PST-DECL
'Goofy didn't buy every ring.'
- b. Kwuki monste-ka motun cooki-lul mek-ci ani ha-yess-ta.
Cookie Monster-Nom every cookie-ACC eat-CI NEG do-PST-DECL
'Cookie Monster didn't eat every cookie.'
- c. Swuntoli-ka motun catongcha-lul sis-ci ani ha-yess-ta.
Swuntoli-NOM every car-ACC wash-CI NEG do-PST-DECL
'Swuntoli didn't wash every car.'
- d. Ttungpo-ka motun khokkili-lul thakca wuy-ey olli-ci ani ha-yess-ta.
fat.man-NOM every elephant-ACC table top-at put-CI NEG do-PST-DECL
'The fat man didn't put every elephant on the table.'

Appendix 2

(61) Fillers for Subject QP - Short neg - neg>□

- a. Khokkili-ka namwu wi-ey ollaka-ci ani ha-yess-ta.
elephant-NOM wood top-at climb-CI NEG do-PST-DECL
'The elephant didn't climb up the tree.'
- b. Kuphi-ka panci-lul pal-ci ani ha-yess-ta.
Goofy-NOM ring-ACC sell-CI NEG do-PST-DECL
'Goofy didn't sell the ring.'
- c. Himseyn cangsa-ka motun pantteyki-lul kkay-ss-ta.
strong man-NOM every wood-ACC break-PST-DECL
'The strong man broke every wood.'
- d. Smuf-ka motun ppang-ul mek-ess-ta.
Smurf-NOM every bread-ACC eat-PST-DECL
'Smurf ate every loaf of bread.'

(62) Fillers for Subject QP - Short neg - □>neg

- a. Wonswungi-ka namwu wi-ey ollaka-ci ani ha-yess-ta.
monkey-NOM wood top-at climb-CI NEG do-PST-DECL
'The monkey didn't climb up the tree.'
- b. Himseyn cangsa-ka motun pyuktol-ul kay-ss-ta.
strong man-NOM every brick-ACC break-PST-DECL
'The strong man broke every brick.'
- c. Ttungpo-ka kewul-ul pal-ci ani ha-yess-ta.
fat.man-NOM mirror-ACC sell-CI NEG do-PST-DECL
'The fat man didn't sell the mirror.'
- d. Smuf-ka motun cooki-lul mek-ess-ta.
Smurf-NOM every cookie-ACC eat-PST-DECL
'Smurf ate every cookie.'

(63) Fillers for Subject QP - Long neg - neg>□; Subject QP - Long neg - □>neg

- a. Wonswungi-ka namwu wi-ey an ollaka-ss-ta.
monkey-NOM wood top-at NEG climb-PST-DECL
'The monkey didn't climb up the tree.'
- b. Himseyn cangsa-ka motun pyuktol-ul kay-ss-ta.
strong man-NOM every brick-ACC break-PST-DECL
'The strong man broke every brick.'
- c. Ttungpo-ka kewul-ul an pal-ass-ta.
fat.man-NOM mirror-ACC NEG sell-PST-DECL
'The fat man didn't sell the mirror.'
- d. Smuf-ka motun cooki-lul mek-ess-ta.
Smurf-NOM every cookie-ACC eat-PST-DECL
'Smurf ate every cookie.'

(64) Fillers for Object QP - Short neg - neg>□

- a. Khokkili-ka namwu wi-ey ollaka-ci ani ha-yess-ta.
elephant-NOM wood top-at climb-CI NEG do-PST-DECL
'The elephant didn't climb up the tree.'
- b. Kuphi-ka panic-lul pal-ci ani ha-yess-ta.
Goofy-NOM ring-ACC sell-CI NEG do-PST-DECL
'Goofy didn't sell the ring.'
- c. Motun namca-ka pantteyki-lul kkay-ss-ta.
every man-NOM wood-ACC break-PST-DECL
'The fat man didn't sell the mirror.'

- d. Motun konglyong-i namwu-eyse kkeleci-ess-ta.
every dinosaur-NOM tree-from fall-PST-DECL
'Every dinosaur fell from the tree.'

(65) Fillers for Object QP - Short neg - □>neg

- a. Wonswungi-ka namwu wi-ey ollaka-ci ani ha-yess-ta.
Monkey-NOM wood top-at climb-CI NEG do-PST-DECL
'The monkey didn't climb the tree.'
- b. Ttungpo-ka kewul-ul pal-ci ani ha-yess-ta.
fat.man-NOM mirror-ACC sell-CI NEG do-PST-DECL
'The fat man didn't sell the mirror.'
- c. Motun namca-ka pyektol-ul kkay-ss-ta.
every man-NOM brick-ACC break-PST-DECL
'Every man broke a brick.'
- d. Motun pelley-ka namwu-eyse tteleci-ess-ta.
every bug-NOM tree-from fall-PST-DECL
'Every bug fell from the tree.'

(66) Fillers for Object QP - Long neg - neg>□; Object QP - Long neg - □>neg

- a. Wonswungi-ka namwu wi-ey an ollaka-ss-ta.
Monkey-NOM wood top-at NEG climb-PST-DECL
'The monkey didn't climb the tree.'
- b. Ttungpo-ka kewul-ul an pal-ass-ta.
fat.man-NOM mirror-ACC NEG sell-PST-DECL
'The fat man didn't sell the mirror.'
- c. Motun namca-ka pyektol-ul kkay-ss-ta.
every man-NOM brick-ACC break-PST-DECL
'Every man broke a brick.'
- d. Motun pelley-ka namwu-eyse tteleci-ess-ta.
every bug-NOM tree-from fall-PST-DECL
'Every bug fell from the tree.'

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