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Two Varieties of Korean: Rightward Head Movement or Polarity Sensitivity?

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A strong argument in favor of the existence of rightward, string-adjacent head movement comes from Han, Lidz, and Musolino (2007). They argue that Korean language-internal variation with respect to the scopal order between negation and universal quantifier objects shows that in the variety where negation takes wide scope, the negative marker must have moved along with the verb/auxiliary to the head of IP. This would then constitute evidence for rightward, string-adjacent head movement. In this article, I argue that this analysis actually makes different predictions than have been attested in Korean. Moreover, I argue that, following a well-known stand with respect to the nature of polarity sensitivity (Chierchia 2013), these facts follow naturally once it is assumed that in one variety, but not the other, universal quantifiers are positive polarity items. This makes the attested language-internal variation in Korean less exceptional since language-internal variation with respect to polarity sensitivity is widely attested.

Keywords: Korean, head movement, rightward movement, language-internal variation, polarity sensitivity

1 Introduction: Rightward, String-Adjacent Head Movement

It is standardly assumed that rightward head movement across other material (complements, adjuncts) is forbidden (see, e.g., Ackema and Neeleman 2002 for discussion). That is, the configuration in (1) is universally ruled out. However, much less clear is whether string-adjacent rightward head movement, as in (2), is allowed or not.

(1) $[_{YP}\ [_{XP}\ t_i\ ZP]\ X_i\text{-}Y]$

(2) $[_{YP}\ [_{XP}\ ZP\ t_i]\ X_i\text{-}Y]$

Whether rightward, string-adjacent head movement exists or not has been a matter of debate for a long time, and has been a central topic of research in the study of head-final East Asian languages such as Korean and Japanese. Otani and Whitman (1991), Yoon (1994), Koizumi (1995, 2000), and Choi (1999), among others, have argued that, in Japanese, verbs must raise out of the VP for reasons involving ellipsis, scrambling, coordination, and negative-polarity-item (NPI) licensing, arguments that also extend to Korean. By contrast, J.-B. Kim (1995), Chung and Park (1997), Hoji (1998), S. Kim (1999), and Fukui and Sakai (2003) have shown that all these facts can also be accounted for by approaches that do not allude to rightward head movement and thus do not provide any evidence in favor of it.

A strong argument in favor of rightward, string-adjacent head movement that has not (yet) been countered comes from language-internal variation in Korean. Korean is a language that has two different forms for negation: a long form *ani* (3a) and a short form *an* (3b).

(3) *Korean*

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

b. Toli-ka an ttena-ss-ta.
Toli-NOM NEG leave-PST-DECL
'Toli didn't leave.'
(Han, Lidz, and Musolino 2007:13, (33); 14, (34))

Apart from phonological length, the long form differs from the short form in the sense that it attaches to the right of the verb instead of the left and that it triggers *do*-support. In (3a), past tense inflection is on the auxiliary; in (3b), on the main verb.

Han, Lidz, and Musolino (HLM) (2007; also see Han, Musolino, and Lidz 2016) have shown that there are two varieties of Korean: a variety where universal quantifier objects take scope above sentential negation, and a variety where such universal quantifier objects take scope below it. These scopal construals are independent from the choice of negative marker.[1]

(4) *Korean*

a. John-i motun chayk-ul an ilk-ess-ta.
John-NOM every book-ACC NEG read-PST-DECL

b. John-i motun chayk-ul ilk-ci ani ha-yess-ta.
John-NOM every book-ACC read-CI NEG do-PST-DECL
(HLM 2007:24, (49))

Variety I: 'John didn't read every book.' $\neg > \forall$

Variety II: 'John read no book.' $\forall > \neg$

As Han, Musolino, and Lidz (2016) show, this variation is attested between speakers, but not within speakers, which suggests that the two varieties of Korean have different grammars. Moreover, they show that this variation appears to be rather arbitrary; for instance, a child's variety cannot be predicted from the variety the child's parents speak.

To account for this language-internal variation, HLM (2007) start out by adopting three fairly standard assumptions. First, they follow Hagstrom (2000, 2002), who argues that objects in Korean always raise from a VP-internal position into the specifier of a VP-external functional position, between vP/VP and IP, dubbed FP. Second, they assume that Korean is scope-rigid (Joo 1989, Ahn 1990, Sohn 1995, Hagstrom 2000). And, third, they argue that the negative marker needs to be adjacent to the finite verb.

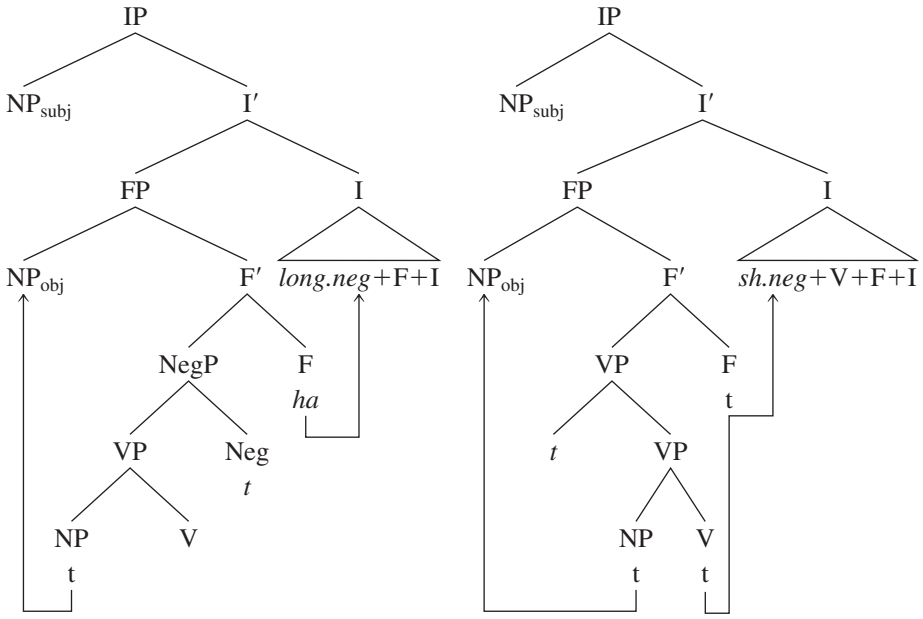
For HLM, the form and meaning of any negative sentence must be subject to these three conditions. However, that does not mean that there is only one way in which negative sentences can be morphosyntactically derived and thus semantically interpreted. In fact, HLM argue that there are two ways in which Korean can satisfy these three requirements, and that speakers vary with respect to which strategy they employ to build negative sentences.

To be more precise, HLM claim that the difference relates to the third condition. There are two ways in which the negative marker can end up being adjacent to the finite verb. Assuming that ~~in~~ Korean negation resides between VP/vP and FP, either the negative marker piggybacks on V-to-I movement and raises along with the verb to the head of IP, triggering high scope of the negation, or the verb and the negation stay in situ and the tense marker undergoes postsyntactic affix hopping and attaches to the auxiliary (in the case of the long form) or the lexical verb (in the case of the short form).

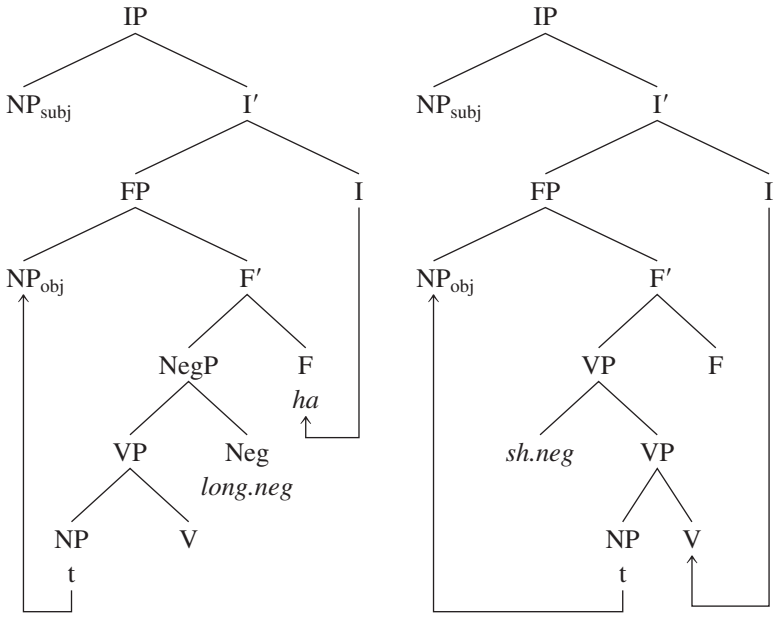
This, then, gives rise to the semantic differences between the two varieties, as shown in (5). In Variety I, negation raises along with the verb to a position (I) higher than the surface position of the object; hence, negation outscopes the quantifier in Spec,FP, as shown in (5a) for both the long form and the short form. In Variety II, by contrast, negation is in a position that is structurally lower than the (raised) object, so that the object outscopes negation (5b). As Korean is scope-rigid, it is neither the case that the object can covertly raise across negation in (5a), nor the case

that the object can reconstruct at LF to its base position in (5b). Hence, the pattern in (4) is derived.

(5) a. *Variety I* (HLM 2007:34–35, (57))



b. *Variety II* (HLM 2007:33–34, (56))



However, it is far from clear that Korean provides evidence for rightward, string-adjacent head movement and that the presence or absence of rightward verb raising explains the difference between the two varieties. In fact, in this article I argue that, on closer inspection, the semantic differences between the two varieties cannot follow from the assumptions that HLM adopt. These assumptions, I will show, would predict both certain unattested readings to be present and other attested readings to be absent. Also, it is far from clear whether negation would ever move to a higher position in Korean.

Instead, I argue that the differences between the two varieties are straightforwardly explained once it is assumed that in Variety II, universal quantifiers are actually positive polarity items (PPIs), along the lines of my (2017) analysis based on Chierchia 2013, whereas in Variety I they are polarity-insensitive. This reduces the language-internal variation in Korean to lexical variation regarding whether elements are polarity-sensitive or not, a dimension along which language-

internal variation is very often attested. This also means that the Korean facts do not empirically support any kind of analysis in terms of rightward, string-adjacent head movement, nor the existence of language-internal variation with respect to that. Consequently, a strong argument in favor of rightward, string-adjacent head movement vanishes.

In section 2, I evaluate the details of HLM 2007 and show how this analysis actually makes different predictions than have been proven correct for Korean. In section 3, I argue that, following a well-known stand with respect to the nature of polarity sensitivity (Chierchia 2013), the facts follow naturally, once it is assumed that in Variety II, but not Variety I, universal quantifiers are PPIs. In section 4, I discuss the consequences of this proposal for syntax and for the range of syntactic variation that can be attested language-internally.

2 Han, Lidz, and Musolino 2007

Above, I noted that according to HLM, the Korean facts follow straightforwardly if it is assumed, first, that objects in Korean always raise from a VP-internal position to a VP-external position (Hagstrom 2000, 2002); second, that Korean is scope-rigid (Joo 1989, Ahn 1990, Sohn 1995, Hagstrom 2000); and third, that the negative marker is adjacent to the finite verb. Whereas the first and third assumptions are well-established in the literature and are not controversial, I question the strength of the second assumption. In addition, I argue that the morphosyntactic forms of negative clauses in Korean actually suggest that negative markers, despite being adjacent to the finite verb, do not raise to any higher position. Let me discuss each assumption in turn.

Korean appears to be scope-rigid with respect to quantifiers that surface in their canonical position; only scrambling gives rise to ambiguity, as shown in (6).

(6) *Korean*

a. Nwukwunka-ka motun salam-ul piphanhay-ss-ta.
someone-NOM every person-ACC criticize-PST-DECL
'Someone criticized every person.' ($\exists > \forall$; $*\forall > \exists$)

b. [Motun salam-ul]$_i$ nwukwunka-ka t_i piphanhay-ss-ta.
every person-ACC someone-NOM criticize-PST-DECL
'Someone criticized every person.' ($\exists > \forall$; $\forall > \exists$)
(HLM 2007:16, (37))

But such scope rigidity between different quantifiers does not necessarily entail anything about the possible scopal relations between quantifiers and other scope-taking elements, such as negation. For instance, in German, quantifiers behave the same way as in Korean in terms of scope rigidity with respect to each other (7) (see Fanselow 2001, Fanselow and Cavar 2001, 2002, Bobaljik and Wurmbrand 2012).

(7) *German*

a. . . . dass fast jeder Mann mindestens eine Frau kennt.
. . . that nearly every.NOM man at.least one.ACC woman knows
' . . . that nearly every man knows at least one woman.' ($\forall > \exists$; $*\exists > \forall$)

b. . . . dass [mindestens eine Frau]$_i$ fast jeder Mann t_i kennt.
. . . that at.least one.ACC woman nearly every.NOM man knows
' . . . that nearly every man knows at least one woman.' ($\forall > \exists$; $\exists > \forall$)

However, German quantifiers are not scope-rigid with respect to negation; the examples in (8) are ambiguous. Moreover, some modals (e.g., *sollen* 'should') take surface scope with respect to negation, whereas other modals (e.g., *dürfen* 'may') exhibit inverse scope, as illustrated in (9). This shows that one cannot conclude that if two DP quantifiers cannot take inverse scope, the same holds for a quantifier and another scope-taking element. Consequently, Korean quantifier scope-rigidity does not prove that quantifiers cannot take scope below negation if they surface above it.

(8) *German*

a. Hat Marie nicht eine Frau gesehen?[2]
has Marie NEG a woman seen
'Hasn't Marie seen a woman?' ($\neg > \exists$; $\exists > \neg$)

b. Jeder hat nicht gearbeitet.[3]
everybody has NEG worked
'Everybody hasn't worked.' ($\forall > \neg$; $\neg > \forall$)

(9) *German*

a. Marie soll nicht gehen.
Marie should NEG leave
'Marie shouldn't leave.' (should $> \neg$; *$\neg >$ should)

b. Marie darf nicht gehen.
Marie may NEG leave
'Marie may not leave.' ($\neg >$ may; #may $> \neg$)

That Korean may actually give rise to inverse scope readings with respect to negation is also evidenced by subject quantifiers in negative sentences. Even though universal subject quantifiers take wide scope with respect to negation (10a), NPI subjects take narrow scope (10b), again in both varieties.

(10) *Korean*

a. Ta an o-ass-ta.
all NEG come-PST-DECL
'All didn't come.' ($\forall > \neg$)

b. Amwuto khwukhi-lul an mek-ess-ta.
anyone cookie-ACC NEG eat-PST-DECL
'Nobody ate the cookies.' ($\neg > \exists$)
(HLM 2007:23, (47a); 8, (17a))

The same holds for NPI objects, which also take scope below negation in both varieties.

(11) *Korean*

John-un amwukesto an mek-ess-ta.
John-TOP anything NEG eat-PST-DECL
'John didn't eat anything.'
(HLM 2007:8, (16a))

But if subjects and objects that surface above negation can give rise to inverse scope readings, it cannot follow from general quantificational scope rigidity that universal quantifier objects in Variety II may not reconstruct below negation. Hence, unless the facts in (10) receive an independent explanation that is compatible with HLM's analysis, this analysis predicts an ambiguity that is not attested, ~~clearly~~ a problematic result.[4]

A second problem, as HLM acknowledge, comes from the fact that Korean speakers of Variety I can also use sentences like (4) for scenarios where John read no book. Under the view that neither negation nor objects may reconstruct in Korean, this is unexpected. HLM argue that this is because the $\forall > \neg$ reading entails the $\neg > \forall$ reading. Indeed, in their truth-value-judgment experiments, informants who accepted the $\neg > \forall$ reading also accepted the $\forall > \neg$ reading (since the $\neg > \forall$ reading is still true in a $\forall > \neg$ scenario).

However, for speakers of a language where a universal quantifier object takes scope below negation (as in English *Mary didn't eat all the cookies*), such sentences are generally not felicitous when uttered in out-of-the-blue scenarios where $\forall > \neg$ is true; this is because such sentences also trigger an existential implicature (e.g., that Mary ate at least one cookie). As Magri (2009, 2011) and Tieu et al. (to appear) show, speakers downgrade sentences that are uttered in a context where their implicatures are false. For instance, when participants are asked to rate sentences on a 3-point scale, they tend to give a middle-ground evaluation when the literal meaning is true

but the implicature is false (e.g., 2 on a scale from 1 to 3, 1 being the lowest grade). However, speakers of Variety I have no problem uttering examples like (12) in a context where John didn't read any books. This is unexpected if the only available scopal construal is $\neg > \forall$. Hence, Variety I shows an ambiguity that is predicted not to arise.

(12) *Korean Variety I*
(Context: John didn't read any books.)
a. John-i motun chayk-ul an ilk-ess-ta.
John-NOM every book-ACC NEG read-PST-DECL
b. John-i motun chayk-ul ilk-ci ani ha-yess-ta.
John-NOM every book-ACC read-CI NEG do-PST-DECL
(HLM 2007:24, (49))

Apart from these two problems, a third arises too. Though HLM do not provide a full morphosyntactic analysis of the different negative markers in Korean, they argue that the long form *ani* heads a NegP, whereas the short form *an* must have a different status, arguably that of an adjunct. The fact that only the long form exhibits *do*-support supports this view (as *do*-support generally pops up when additional heads emerge in the clausal spine—here, Neg next to V, F, and I). Also, in strictly head-final languages like Korean, heads (like *ani*) appear to the right of the verb, whereas specifiers/adjuncts (like *an*) appear to its left.

Of course, the way these negative markers are analyzed has theoretical repercussions. In English, *do*-support does not take place if the head of IP directly selects the vP/VP. Under affix-hopping approaches (going back to Chomsky 1957; see Bobaljik 1995 and Embick and Noyer 1999 for more recent implementations—in the latter case in terms of postsyntactic morphological lowering), this results from the fact that the affix that realizes I's features can appear on the verb only if its projection is immediately selected by I; however, if some other functional projection intervenes, such as NegP, affix hopping is no longer an option, and a *do*-auxiliary needs to be inserted. Other approaches (see, e.g., Chomsky 1995, Lasnik 1995, 2000) argue that *do*-support is last-resort insertion of a dummy auxiliary when the verb cannot raise to I across another head itself. Either way, this means that no instance of *ani* involves verbal raising; instead, I's featural realization appears on the auxiliary. Hence, it is questionable whether any occurrence of *ani*, in either Variety I or Variety II, ever reflects verbal movement.

As for the other negative marker, *an*, since it is not a head but an adjunct, its surface position is fully compatible with no head movement taking place within the IP. In its base position, *an* already ends up being adjacent to the verb. Even if the verb itself raised to T, it is far from clear why any specifier/adjunct would raise along with it (as proposed in the right-hand structure in (5a). Head movement by definition raises across specifiers/adjuncts. Hence, purely from the perspective of the morphosyntax of negative clauses in Korean, neither of the two negative markers provides any evidence for their movement to a higher position.

All these problems call for an alternative analysis of the Korean facts. In the next section, I will formulate such an alternative, arguing that the difference between the two varieties lies in the polarity sensitivity of universal quantifiers. In Variety I, universal quantifiers are polarity-insensitive, allowing them to reconstruct below negation and thus to be able to give rise to both scopal construals. In Variety II, they are PPIs, which forbids them from reconstructing below negation once they appear above it at surface structure, explaining why in this variety objects cannot reconstruct.

3 Universal Quantifier PPIs

3.1 A Short Note on Existential NPIs

As is well-known, there is a large class of existential/indefinite negative polarity items (NPIs) whose distribution is restricted to downward-entailing (DE) contexts (see Ladusaw 1979 and much subsequent work). Naturally, the question arises: what restricts such elements to DE contexts? As Krifka (1995), Lahiri (1998), Chierchia (2006, 2013), and others argue, NPIs that are fine in DE contexts are ruled out outside such contexts, since in the latter case their semantics would give

rise to a contradiction. This means that the sentences in (13), even though they are judged unacceptable, are strictly speaking not syntactically ill-formed; rather, they violate their usage conditions (Kadmon and Landman 1993) or yield a semantic anomaly (Krifka 1995, Lahiri 1998, Chiercha 2006, 2013).

(13) a. *Mary has ever been there.
b. *I read any book.

As we will see, this approach explains not only why NPIs are restricted to DE contexts but also why other kinds of elements (PPIs) may not appear in certain DE contexts, something that will turn out to be relevant for the analysis of the Korean universal quantifiers. Following Chierchia's (2006, 2013) implementation of this intuition, NPIs are equipped with an uninterpretable feature [uσ,D], which obligatorily introduces all its domain and scalar alternatives and which at surface structure must be checked by a covert c-commanding exhaustifier that carries an interpretable feature [iσ,D]. Chierchia then argues that the combination of these two requirements triggers a semantic contradiction for every NPI outside a DE context. For a brief illustration, let us focus on (13b). For Chierchia, the uninterpretable [uσ,D] of *any book* needs to be checked ((14a) is ungrammatical). Once it is checked by the covert exhaustifier (the only element able to check this feature), a logical contradiction is yielded (14b).

(14) a. [I read [any book]$_{[u\sigma,D]}$]
b. [EXH$_{[i\sigma,D]}$ [I read [any book]$_{\sout{[u\sigma,D]}}$]]

To see this, suppose that the domain of quantification is the set of books {a,b,c}. Then, ⟦I read any book⟧ denotes ∃x.[x∈{a,b,c} & read(I,x)]. Now, the domain alternatives of ∃x.[x∈{a,b,c} & read(I,x)] are these:

(15) a. ∃x.[x∈{a,b,c} & read(I,x)]
b. ∃x.[x∈{a,b} & read(I,x)]
c. ∃x.[x∈{a,c} & read(I,x)]
d. ∃x.[x∈{b,c} & read(I,x)]
e. ∃x.[x∈{a} & read(I,x)]
f. ∃x.[x∈{b} & read(I,x)]
g. ∃x.[x∈{c} & read(I,x)]

Apart from (15a), all domain alternatives in (15) are stronger than ∃x.[x∈{a,b,c} & read(I,x)]. If EXH applies to ∃x.[x∈{a,b,c} & read(I,x)], all nonweaker domain alternatives in (15) must be false.

(16) ⟦EXH(I read any books)⟧ =
[λp.p & ∀q∈Alt(p)[p ⊄ q → ¬q]](∃x.[x∈{a,b,c} & read(I,x)]) =
∃x.[x∈{a,b,c} & read(I,x)] &
¬∃x.[x∈{a,b} & read(I,x)] & ¬∃x.[x∈{a,c} & read(I,x)] & ¬∃x.[x∈{b,c} & read(I,x)] & ¬∃x.[x∈{a} & read(I,x)] &
¬∃x.[x∈{b} & read(I,x)] & ¬∃x.[x∈{c} & read(I,x)]

But the conjunction of all negated stronger domain alternatives entails that there is no element, a member of the set of books {a,b,c}, that has been read by me. This already follows from the three negated domain alternatives where the domain of quantification is a singleton set: ¬∃x.[x∈{a} & read(I,x)] & ¬∃x.[x∈{b} & read(I,x)] & ¬∃x.[x∈{c} & read(I,x)]↔¬∃x.[x∈{a,b,c} & read(I,x)]. But then ⟦EXH(I read any books)⟧ must have the denotation in (17), which forms a logical contradiction.

(17) ∃x.[x∈{a,b,c} & read(I,x)] & ¬∃x.[x∈{a,b,c} & read(I,x)]

For Chierchia, following Gajewski (2002), sentences that are logically contradictory are judged unacceptable.[5] If logically contradictory statements indeed trigger unacceptability judgments, the unacceptability of (14b) directly follows.

However, if the NPI is embedded in a DE context, things change. To see this, consider (18).

(18) I didn't read any book.

Again, exhaustification will result in all nonweaker domain alternatives of (18) being false. But now, no domain alternative of (18) is actually stronger than (18), because negation reverses the direction of the inferences. Consequently, exhaustification of (18) applies vacuously: ⟦EXH(I didn't read any book)⟧ = ⟦I didn't read any book⟧. The sentence just has the reading $\neg\exists x.[x\in\{a,b,c\} \,\&\, \text{read}(I,x)]$ and is thus acceptable.

3.2 A Longer Note on Universal PPIs

What is less well-known is that the universal counterparts of such NPIs form a natural class of elements that may actually appear in DE environments, but once they surface above them, they cannot reconstruct into these contexts. Concretely, this means that such universals can take scope under negation, but cannot reconstruct below negation.

To see this, consider the nonexisting word *pevery*: a universal quantifier that carries the same properties that render existential quantifiers NPIs. At first glance, it is predicted to be a PPI, with the underlying syntax shown in (19b).

(19) a. I read pevery book.
b. $[\text{EXH}_{[i\sigma,D]}$ [I read [pevery book]$_{\{u\sigma,D\}}$]]

In a positive sentence like (19b), the exhaustifier applies vacuously. The reason is that none of the domain alternatives of *I read pevery book* are stronger than *I read pevery book* itself: of all the propositions in (20), (20a) is the strongest.

(20) a. $\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I,x)]$
b. $\forall x.[x\in\{a,b\} \rightarrow \text{read}(I,x)]$
c. $\forall x.[x\in\{a,c\} \rightarrow \text{read}(I,x)]$
d. $\forall x.[x\in\{b,c\} \rightarrow \text{read}(I,x)]$
e. $\forall x.[x\in\{a\} \rightarrow \text{read}(I,x)]$
f. $\forall x.[x\in\{b\} \rightarrow \text{read}(I,x)]$
g. $\forall x.[x\in\{c\} \rightarrow \text{read}(I,x)]$

However, things are different with the negative counterpart of (19).

(21) a. I didn't read pevery book.
b. $[\text{EXH}_{[i\sigma,D]}$ [I didn't read [pevery book]$_{\{u\sigma,D\}}$]]

The semantics of (21b) yields a logical contradiction, for the very same reason as the semantics of (14b): all domain alternatives of $\neg\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I,x)]$, listed in (22), entail $\neg\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I,x)]$.

(22) a. $\neg\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I,x)]$
b. $\neg\forall x.[x\in\{a,b\} \rightarrow \text{read}(I,x)]$
c. $\neg\forall x.[x\in\{a,c\} \rightarrow \text{read}(I,x)]$
d. $\neg\forall x.[x\in\{b,c\} \rightarrow \text{read}(I,x)]$
e. $\neg\forall x.[x\in\{a\} \rightarrow \text{read}(I,x)]$
f. $\neg\forall x.[x\in\{b\} \rightarrow \text{read}(I,x)]$
g. $\neg\forall x.[x\in\{c\} \rightarrow \text{read}(I,x)]$

Then, the meaning of (21b) is again contradictory and should render the sentence unacceptable.

(23) ⟦EXH(I didn't read pevery book)⟧ =
$[\lambda p.p \,\&\, \forall q\in\text{Alt}(p)[p \not\subseteq q \rightarrow \neg q]](\neg\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I,x)]) =$
$\neg\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I,x)] \,\&$
$\forall x.[x\in\{a,b\} \rightarrow \text{read}(I,x)] \,\&\, \forall x.[x\in\{a,c\} \rightarrow \text{read}(I,x)] \,\&$
$\forall x.[x\in\{b,c\} \rightarrow \text{read}(I,x)] \,\&\, \forall x.[x\in\{a\} \rightarrow \text{read}(I,x)] \,\&$
$\forall x.[x\in\{b\} \rightarrow \text{read}(I,x)] \,\&\, \forall x.[x\in\{c\} \rightarrow \text{read}(I,x)]$

Given Chierchia's approach, the universal counterpart of NPI *any* is thus predicted to be a PPI. But languages do not seem to employ such universal quantifier PPIs. Universal quantifiers like English *all*, *everybody*, and *everything* can all take scope below negation. However, as I argue in Zeijlstra 2017, even if these quantifiers had the same semantics as *pevery*, they could still take scope below negation. Let me show why.

In order for the contradiction to arise, the scopal construal of an example involving an NPI, like (14b), should be (24).

(24) EXH > DE > NPI

All scopal configurations of EXH, DE, and NPI other than (24) give rise to either a feature-checking violation (if EXH does not c-command the NPI) or a logical contradiction. However, in the domain of universal PPIs, things are different. While (25) is a scopal configuration that yields ungrammaticality, other scopal configurations between EXH, a DE operator, and a PPI are fine, as long as EXH c-commands and thus outscopes the PPI at surface structure given the PPI's feature-checking requirement.

(25) *EXH > DE > PPI

In one such configuration that is fine, the DE operator appears under the scope of the PPI, as in (26).

(26) EXH > PPI > DE

Another licit scopal configuration is the one in (27).

(27) DE > EXH > PPI

Nothing in (27) violates any rule of grammar. To see this, consider (28a), repeated from (21a), but now with the logical form in (28b).

(28) a. I didn't read pevery book.
b. [not [$\text{EXH}_{[i\sigma,D]}$ [I read [pevery book]$_{\sout{[u\sigma,D]}}$]]]

The exhaustifier in (28b) applies vacuously. The reason is that *I read pevery book* is first exhaustified before negation applies. But then, exhaustification applies vacuously: of all the propositions in (29), (29a) is the strongest.

(29) a. $\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I,x)]$
b. $\forall x.[x\in\{a,b\} \rightarrow \text{read}(I,x)]$
c. $\forall x.[x\in\{a,c\} \rightarrow \text{read}(I,x)]$
d. $\forall x.[x\in\{b,c\} \rightarrow \text{read}(I,x)]$
e. $\forall x.[x\in\{a\} \rightarrow \text{read}(I,x)]$
f. $\forall x.[x\in\{b\} \rightarrow \text{read}(I,x)]$
g. $\forall x.[x\in\{c\} \rightarrow \text{read}(I,x)]$

Hence, the meaning of [EXH [I read [pevery book]]] is the same as the meaning of [I read [pevery book]] (both mean $\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I,x)]$), which can subsequently be negated without any problem (yielding $\neg\forall x.[x\in\{a,b,c\} \rightarrow \text{read}(I,x)]$). Thus, a universal quantifier PPI can actually take scope below negation, provided the logical form is one where negation does not take scope between the (higher) EXH and the (lower) PPI.

If, however, the PPI c-commands its antilicenser at surface structure, the exhaustifier must be in a position c-commanding both the PPI and the DE antilicenser, as in (26). Again, this scopal construal is unproblematic, as the exhaustifier applies to a universal that is not in a DE context; therefore, it has no nonweaker alternative that could trigger a contradiction.

At the same time, in any sentence with the surface order EXH > PPI > DE, the PPI may not reconstruct below the DE operator (also in cases where non-PPIs would be allowed to reconstruct). The reason is that this PPI would then end up in the illicit scopal configuration (25), yielding a logical contradiction. Those PPIs that are PPIs due to the presence of [uσ,D] are thus

elements that (a) can appear and take scope under DE operators at surface structure, and (b) when they appear above a DE operator at surface structure, may not reconstruct below it. Such PPIs have indeed been attested. A good example is Dutch *iedereen* everybody.

For most speakers of Dutch (and several northern German varieties), universal quantifiers like *iedereen* everybody cannot reconstruct below negation (see Zeijlstra 2004, 2017, Abels and Martí 2010). The same also holds for (Levantine/Jordanian) Arabic and Japanese (see Zeijlstra 2017).

(30) *Dutch*
Iedereen vertrok niet.
everybody left NEG
'Nobody left.' $\forall > \neg$; $*\neg > \forall$

(31) *Jordanian Arabic*
Kul t-tulaab ma mashu.
all the-students NEG walked
'No student walked.' $\forall > \neg$; $*\neg > \forall$

(32) *Japanese*
Zen'in-ga sono testo-o uke-nakat-ta.
all-NOM that test-ACC take-NEG-PST
'Nobody took that test.' $\forall > \neg$; $*\neg > \forall$

Following Zeijlstra (2017), these facts directly follow once universal quantifiers in Dutch, northern German, (Levantine/Jordanian) Arabic, and Japanese are taken to be PPIs. Focusing here on the Dutch example, if *iedereen* is a PPI, it must be c-commanded by EXH at surface structure, and reconstructing it below negation would result in the contradictory reading EXH > NEG > PPI, thus providing a simple solution for this problem.

That this analysis is correct can actually be proven. As outlined by Szabolcsi (2004), PPI-hood can be diagnosed in four different ways (of which the fourth test is the most prominent one). First, PPIs should be fine under metalinguistic negation. This is indeed the case for Dutch *iedereen*, which may take scope under metalinguistic negation.

(33) *Dutch*
A: Iedereen gaat de kamer uit.
everybody goes the room out
'Everybody leaves the room.'
B: Nee, onzin. Iedereen gaat niet de kamer uit; alleen Jan en Piet.
no nonsense everybody goes NEG the room out only Jan and Piet
'No, nonsense. Not everybody leaves the room, only Jan and Piet do.'

Second, PPIs can scope under negation if a proper intervener scopes between the PPI and its antilicenser, such as a universal quantifier like *always*. Example (34) is true in a situation where it is not always the case that everybody leaves the room.[6]

(34) *Dutch*
Iedereen gaat niet altijd de kamer uit.
everybody goes NEG always the room out
'It is not always the case that everybody leaves the room.'

Third, PPIs can take scope under clause-external negation. Again, this applies to *iedereen* as well.

(35) *Dutch*
Ik zeg niet dat iedereen vertrekt; alleen Jan vertrekt.
I say NEG that everybody leaves only Jan leaves
'I'm not saying that everybody leaves; only Jan leaves.'

Fourth, and finally, as shown by Baker (1970), Szabolcsi (2004) and Iatridou and Zeijlstra (2013), (weak) PPIs can be rescued under two antilicensers (with the higher one being a non-antiadditive

antilicenser). Then they take scope below both of them. Again, this is the case for Dutch *iedereen.* Take (36). The highest antilicenser is the predicate meaning 'surprise', the lowest one the negation. The most salient reading of this sentence is one where the speaker is surprised that not everybody stayed (i.e., the speaker is surprised that some people left). Again, this reading is only possible if *iedereen* is allowed to reconstruct under negation.

(36) *Dutch*
Het verbaast me dat iedereen niet blijft.
it surprises me that everybody NEG stays
'It surprises me that not everybody stays.'

Hence, it is safe to conclude that Dutch *iedereen* is indeed a PPI of the relevant type, and thus, the existence of such PPIs is also empirically evidenced.

3.3 Getting Back to Korean

Returning to the Korean data, one solution immediately suggests itself. If it is assumed that in Variety I, universal quantifier objects are polarity-insensitive, but in Variety II, they are PPIs of the kind described above, all relevant facts naturally follow without alluding to any kind of optional, string-adjacent, rightward head movement. In that case, the syntactic structure of a negative sentence with an object is as in (37), again following Hagstrom (2000, 2002), who argues that objects in Korean always raise from a VP-internal position to a VP-external position.

(37) $[_{\text{IP}}\ [_{\text{FP}}\ \text{Obj}_i\ [_{\text{NegP}}\ [_{\text{VP}}\ \langle \text{Obj}_i \rangle\ \text{V}]\ \text{Neg}]\ \text{F}]\ \text{I}]$

Now, let's see what happens if the object is a universal quantifier. In Variety I, the object can but need not reconstruct. This correctly predicts that in Variety I, both the construal $\neg > \forall$ and the construal $\forall > \neg$ should be available. However, in Variety II reconstruction below negation is banned, as it would lead to a contradiction. Hence, in Variety II only the construal $\forall > \neg$ is available. This is indeed what has been observed.

To evaluate this analysis, we need to test three predictions it makes. First, it predicts that if a universal quantifier object in Korean appears structurally below a higher negation, it should be allowed to take scope below negation as well. Second, it predicts that if the universal quantifier object appears in contexts that allow PPIs to take scope below negation, the former should indeed take narrow scope with respect to the latter. And third, whereas the analysis based on head movement does not distinguish between types of object (any scope-taking object in Variety I should take narrow scope with respect to negation and any scope-taking object in Variety II should take wide scope with respect to it), under the proposed analysis this scopal variation should be restricted to universal quantifiers only. Below, I evaluate all three predictions, showing that they are indeed correct.

The first prediction is confirmed. If the sentence contains a negated subject NPI, as in (38), the universal quantifier object indeed takes scope below negation and the subject. The only reading (38) has, in both varieties, is the one where nobody ate any cookies.[7]

(38) *Korean*
Amwuto khwukhi-lul an mek-ess-ta.
anybody cookie-ACC NEG eat-PST-DECL
'Nobody ate the cookies.'
(HLM 2007:8)

The second prediction is borne out as well. As discussed earlier, PPIs can be rescued under two antilicensers (the higher one being a non-antiadditive antilicenser). Hence, the scopal construal $\neg > \forall$ should be available in both varieties, crucially also in Variety II, under contexts like 'only N', 'few N', or 'at most N'. This is indeed the case; speakers of both varieties accept the readings in (39).

(39) *Korean*

a. John-man-i motun chayk-ul an ilk-ess-ta.
John-only-NOM every book-ACC NEG read-PST-DECL
'Only John didn't read every book.'

b. Soswu-uy haksayng-tul-i motun chayk-ul an ilk-ess-ta.
few-GEN student-PL-NOM every book-ACC NEG read-PST-DECL
'Few students didn't read every book.'

c. Choytay sey myeng-uy haksayng-tul-i motun chayk-ul an ilk-ess-ta.
maximum three CLASSIFIER-GEN student-PL-NOM every book-ACC NEG read-PST-DECL
'At most three students didn't read every book.'

As for the third prediction, at first sight it may not be confirmed. In Variety II, interchanging the object with other scope-taking expressions, such as 'many N', 'exactly three N', or 'most N', does not change the scopal construal between the negation and the object, as shown in (40).

(40) *Korean*

a. John-i manhun chayk-ul an ilk-ess-ta.
John-NOM many book-ACC NEG read-PST-DECL
'Many books John didn't read.'

b. John-i sey kwen-uy chayk-ul an ilk-ess-ta.
John-NOM three CLASSIFIER-GEN book-ACC NEG read-PST-DECL
'Exactly three books John didn't read.'

c. John-i taypwupwun-uy chayk-ul an ilk-ess-ta.
John-NOM most-GEN book-ACC NEG read-PST-DECL
'Most books John didn't read.'

One may wonder why these scope-taking expressions cannot reconstruct below negation if only the universal quantifier is blocked from doing so because of its polarity sensitivity. However, such expressions may also not reconstruct below negation in languages where universal quantifiers actually can do so. The English examples (41a–c) do not allow any inverse scope reading either, even though (42) does.

(41) a. Many students didn't leave.
b. Exactly three students didn't leave.
c. Most students didn't leave.

(42) Every student didn't leave.

The reason for this, following Mayr and Spector (2012), is that inverse scope must be entailed by the surface scope in order to be available. That is the case for (42), but not for (41). Hence, these facts do not confirm or disconfirm the third prediction. Luckily, there is another way to test this prediction in Korean. If, in Variety I, the fact that the universal quantifier object takes narrow scope with respect to negation is due to reconstruction, the prediction is that the examples in (40) have the same readings in Varieties I and II. These other expressions simply cannot reconstruct below negation, even though the universal quantifier can. Under HLM's account, by contrast, these should all take narrow scope with respect to negation, as they all surface below it. Indeed, speakers of both Variety I and Variety II assign the same readings to the examples in (40), thus confirming the third prediction as well—under HLM's approach, these readings are predicted to be unavailable.

4 Consequences

The Korean facts can thus be better, more simply, and more adequately explained by merely reducing the difference between the two varieties to the polarity sensitivity of the universal quantifier: in Variety II, it is a PPI; in Variety I, it is not.

Such language-internal variation is not surprising. In fact, variation with respect to polarity sensitivity is widely attested in other languages as well, as we saw earlier for universal quantifier

subjects. Also, as Abels and Martí (2010) point out, only for a subset of German speakers do examples like (43), also involving universal quantifiers in negative contexts, allow an inverse scope reading. This reading is available more easily for southern speakers of standard German than for northern speakers.

(43) *German*
Jeder Artz hat kein Auto.[8]
every doctor has no car
'Not every doctor has a car.'

With respect to other elements as well, variation with respect to polarity sensitivity is attested both across languages and language-internally. For instance, as pointed out by Israel (1996), Iatridou and Zeijlstra (2010, 2013), and Homer (2015), universal modals that take wide scope with respect to sentential negation, like English *must*, *should*, and *ought to*, should be analyzed as PPIs.

(44) a. She must not leave. $\Box > \neg$
b. She should not leave. $\Box > \neg$
c. She ought not to leave. $\Box > \neg$

The reason why these modals are analyzed as PPIs is that only these modal auxiliaries outscope negation. Other modal auxiliaries, existential modals and other universal modals alike, in principle, take scope under negation.

(45) a. She doesn't have to leave. $\neg > \Box$
b. She doesn't need to leave. $\neg > \Box$

(46) a. She cannot leave. $\neg > \Diamond$
b. She may not leave. $\neg > \Diamond$

But it is not the case that crosslinguistic counterparts of the modals in (44) must be PPIs as well. German *müssen*, a cognate of English *must*, scopes below negation.

(47) *German*
Sie muss nicht abfahren.
she must not leave
'She doesn't have to leave.' $\neg > \Box$

Such variation may also apply language-internally. Dutch modal *moeten* 'must' is a PPI in most western varieties of the language, but not in most eastern varieties (see latridou and Zeijlstra 2013).

(48) *Dutch*
Zij moet niet vertrekken.
she must NEG leave
'She mustn't leave.' Western Dutch varieties
'She doesn't have to leave.' Eastern Dutch varieties

And, similarly, Dutch *ooit* 'ever' was an NPI in northern varieties (until the 1960s), but has not been in southern varieties (see Hoeksema 1999). Consequently, the type of variation attested in Korean is not in any way exceptional: it belongs the type of semantic variation that is systematically attested across languages.

To conclude, the observed Korean language-internal variety provides no evidence for the existence of rightward (string-adjacent) head movement in syntax, nor for arbitrary variation with respect to it. All Korean facts are better explained by assuming that head movement is uniformly absent. This dismisses what seemed a strong argument in favor of rightward, string-adjacent head movement in languages like Japanese and Korean.

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