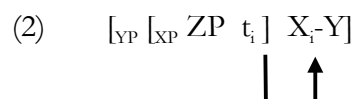
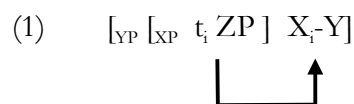


Two varieties of Korean, or the ban against rightward head movement

Abstract: One of the strongest arguments in favour of the existence of rightward, string-adjacent head movement comes from Han, Lidz & 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 paper, 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 (PPIs). This makes the attested language-internal variation in Korean less exceptional as language-internal variation with respect to polarity-sensitivity is widely attested.

1. Introduction: rightward, string-adjacent head movement

It is standardly assumed that rightward head movement across other material (complements, adjuncts) is forbidden. 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.



Whether rightward, string-adjacent head movement exists or not has been an issue 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 or Japanese. Otani & 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 NPI licensing, arguments that also extend to Korean. By contrast, Kim (1995), Kim (1999), Chung & Park (1997), Hoji (1998), and Fukui & 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 favour of it.

The argument in favour of rightward, string-adjacent head movement that is often considered the strongest one comes from language-internal variation in Korean. Korean is a language that has two different forms for negation: a short form *an* ((3)a), and a long form *ani* ((3)b).

- | | | | |
|-----|----|-----------------------------------|---------------|
| (3) | a. | Toli-ka ttena-ci ani ha-yess-ta | Korean |
| | | Toli-NOM leave-CI NEG do-PST-DECL | |
| | | ‘Toli didn’t leave.’ | (HLM07: (33)) |
| | b. | Toli-ka an ttena-ss-ta. | |
| | | Toli-NOM NEG leave-PST-DECL | |
| | | ‘Toli didn’t leave.’ | (HLM07: (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 (3)a, past tense inflection is on the auxiliary, in (3)b, on the main verb.

Han et al. (2007, 2016) have shown that there are two varieties of Korean: a variety where universal quantifier objects outscope sentential negation, and a variety where such universal quantifier objects take scope below sentential negation. The scopal construals here are independent from the choice of negative marker:

- | | | | |
|-----|----|-------------------------------------|--------|
| (4) | a. | John-i motun chayk-ul an ilk-ess ta | Korean |
|-----|----|-------------------------------------|--------|

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

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

Variety II: 'John read no book' $\forall > \neg$ (HLM07: (49))

As Han et al. (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, it cannot be predicted on the basis of the variety of the parents what variety a child has.

In order to account for this language-internal variation, Han et al. (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, in 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, morpho-syntactically, the negative marker needs to attach to the finite verb.

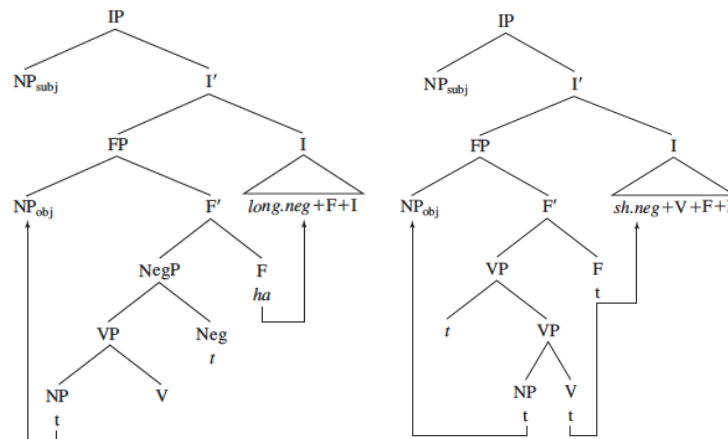
For Han et al. (2007), the form and meaning of any negative sentence must be subject to these three conditions. However, that does not mean that there is only one way in which negative sentences can be morpho-syntactically derived and thus semantically interpreted. In fact, they argue that there are two ways in which Korean can satisfy these three requirements, and that speakers vary with among each other with respect to which strategy they employ to build negative sentences.

To be more precise, the difference for Han et al. (2007) concerns the third condition. There are two ways in which the negative marker can morphologically attach to the finite verb. Assuming that in Korean negation resides in between VP/vP and FP, either the negative marker piggy-bags on V-to-I movement and raises along with the verb to the head of IP, triggering high scope of the negation, or, alternatively, the verb and negation stay in situ and the tense marker undergoes post-

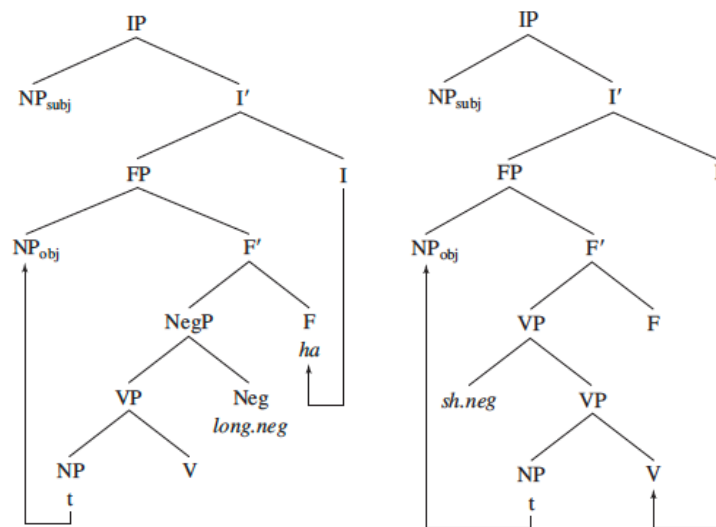
syntactic affix hopping and attaches to negative marker (in case of the long form) or the verb (in case of the short form). In those cases, the negative marker stays in situ.

This, then, gives rise to the semantic differences between the two varieties as in (5). In Variety I, negation raises along with the verb to a position (I) higher than the surface position of the object and, hence, negation outscopes the quantifier in Spec,FP, as shown in (5)a 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, such that the object outscopes negation (5)b. As Korean is scope-rigid, it is neither the case that the object can covertly raise across negation in (5)a, nor can the object reconstruct at LF to its base position in in (5)b. Hence, the pattern in (4) is derived.

(5) a. Variety I (HLM07: (57)):



b. Variety II (HLM07: (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, I argue in this paper that, at closer inspection, the semantic differences between the two varieties cannot follow from the assumptions that Han et al. adopt. These assumptions, I will show, would both predict 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.

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 Zeijlstra (2017), whereas in Variety I they are polarity-insensitive. This reduces the language-internal variation in Korean to lexical variation with respect to elements being polarity-sensitive or not, a dimension along which language-internal variation is very often attested. This also means that the Korean facts do not motivate any kind of analysis in terms of rightward, string-adjacent head movement, nor any (language-internal) variation with respect to that. Consequently, the perhaps strongest argument in favour of rightward, string-adjacent head movement vanishes.

In section 2, I will evaluate the details of Han et al., 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 actually follow naturally once it is assumed that in Variety II, but not in Variety I, universal quantifiers are PPIs. In section 4, I discuss the consequences of this proposal for syntax and the range of syntactic variation that can be attested language-internally.

2. Han et al. (2007)

Above, I argued that according to Han et al. 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, morpho-syntactically, the negative marker needs to attach to the finite verb. Whereas the first and third assumption are well established in the literature and are not controversial, I question the strength of the second assumption. Moreover, I argue that the morphosyntactic forms of negative clauses in Korean, actually suggest that negative markers, despite being attached to the finite verb, do not to raise to any higher position. Let's discuss each issue 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 below:

- (6) a. Nwukwunka-ka motun salam-ul piphanhay-ss-ta. Korean
 someone-NOM every person-ACC criticise-PST-DECL
 'Someone criticised every person' ($\exists > \forall$; $*\forall > \exists$)
- b. [Motun salam-ul]_i nwukwunka-ka t_i piphanhay-ss-ta
 every person-ACC someone-NOM criticise-PST-DECL
 'Someone criticised every person' ($\exists > \forall$; $\forall > \exists$) (HLM07: (37))

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

- (7) a. ... dass fast jeder Mann mindestens eine Frau kennt German
 ... 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] fast jeder Mann t_i kennt
 ... that at least one.ACC woman 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 arrive at the conclusion that if two quantifiers cannot take inverse scope, the same holds for a quantifier and another scope-taking element. Hence, Korean quantifier scope-rigidity does not prove that quantifiers cannot take scope below negation if they surface above it.

- (8) a. Marie hat nicht eine Frau gesehen German
 Marie has neg a woman seen
 ‘Marie hasn’t seen a woman’ ($\neg > \exists$; $\exists > \neg$)
- b. Jeder hat nicht gearbeitet
 Everybody has neg worked

- (9) a. ‘Everybody hasn’t worked’ $(\forall > \neg; \neg > \forall)^1$
 Marie soll nicht gehen German
 Marie should neg leave
 ‘Marie shouldn’t leave’ $(\text{should} > \neg; * \neg > \text{should})$
- b. Marie darf nicht gehen
 Marie may neg leave
 ‘Marie may not leave’ $(\neg > \text{may}; \# \text{may} > \neg)$

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 ((10)a), NPI subjects take narrow scope ((10)b), again in both varieties.

- (10) a. Ta an o-ass-ta Korean
 all neg come-PST-DECL
 ‘All didn’t come’ $(\forall > \neg)$ (HLM07: (47))
- b. Amwuto khwukhi-lul an mek-ess-ta
 anyone cookie-ACC neg eat-PST-DECL
 ‘Nobody ate the cookies’ $(\neg > \exists)$ (HLM07: (17))

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

- (11) John-un amwukesto an mek-ess-ta.
 John-TOP anything NEG eat-PST-DECL

¹ In certain northern varieties of German, the inverse scope reading is absent, though, something I will discuss later on in Section 3.

‘John didn’t eat anything.’

(HLM07: (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 Han et al.’s analysis, this analysis predicts an ambiguity that is not attested.

A second problem, as acknowledged by Han et al., 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. Han et al. argue that this is due to the fact that the $\forall > \neg$ reading entails the $\neg > \forall$ reading. Indeed, in their truth-value-judgement experiments, informants who accept the $\neg > \forall$ reading also accept 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 a scenario where $\forall > \neg$ is true, the reason being that such sentences also trigger an existential implicature (e.g. that Mary ate at least one cookie). Even though the prediction is confirmed that such sentences are fine with a $\forall > \neg$ construal when truth-value judgements are solicited, it is also predicted that such examples cannot be used with such a construal in out of the blue contexts. However, speakers of Variety I are generally fine with that, as shown in (12) below. Hence, Variety I shows an ambiguity that is predicted to not arise.

(12) Context: *John didn’t read any books*

- a. John-i motun chayk-ul an ilk-ess ta Korean Var. I
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

Apart from these two problems, a third problem arise too. Han et al. don't provide a full morpho-syntactic analysis of the different negative markers in Korean, but 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, just like *an*, appear on the left side.

The way these negative markers are analyzed has, of course, theoretical repercussions. For one, *do*-support is generally the result of the fact that affix hopping all of the sudden becomes impossible. In English, affix hopping is allowed if the head of IP directly selects the vP/VP. Following Bobaljik (1995), the affix that realizes I's features can appear on the verb if its projection is immediately selected by I. If, however, some other functional projection, such as NegP, intervenes, affix hopping is no longer an option, and a *do*-auxiliary needs to be inserted. If this analysis of *do*-support is correct, it means that in no instance of *ani*, verbal raising is going on, but rather I's featural realization appears on the verb in its base position (given that *do*-support is incompatible with verbal raising). Hence, it is questionable whether any occurrence of *ani*, either in Variety I and II, may ever reflect verbal movement.

Note that since *an* is not a head but rather an adjunct, the surface position if *an* is fully compatible with an affix hopping analysis, as its only morpho-phonological requirement is that, being clitic-like in nature, it attaches to the verb, irrespective of the verb's position. Of course, this does not mean that the verb in itself cannot have raised to T', but it is far from clear why any specifier/adjunct should raise along (as is proposed in the rightmost structure in (5)a): head movement generally strands specifiers/adjuncts. Hence, purely from the perspective of the morphosyntactic forms of negative clauses in Korean, negative markers appear not to raise to any

higher position.

These problems thus call for an alternative analysis of the Korean facts. In the next section, I will formulate such an alternative, arguing that the difference lies in the polarity-sensitivity of universal quantifiers. In Variety I, universal quantifiers are polarity-insensitive, allowing them to reconstruct below negation, and thus be able to give rise to both scopal construals. In Variety II, they are PPIs, which forbids them to reconstruct 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 existentials/indefinites Negative Polarity Items (NPIs) whose distribution is restricted Downward Entailing (DE) contexts. Following Krifka (1995), Lahiri (1998), Chierchia (2006, 2013), among others, NPIs that are only fine in DE contexts are ruled out outside such contexts, since, then, 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, but rather violate their usage conditions (Kadmon & Landman 1993) or yield a semantic anomaly (Krifka 1995; Lahiri 1998; Chierchia 2006, 2013).

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

Following Chierchia's (2006, 2013) implementation of this intuition, NPIs are equipped with an uninterpretable feature $[\text{u}\sigma, \text{D}]$, which obligatorily introduces all its domain and scalar alternatives and which must be checked by a covert c-commanding exhaustifier that carries an interpretable feature $[\text{i}\sigma, \text{D}]$. Chierchia then argues that the combination of these two requirements triggers a semantic contradiction for every NPI outside a DE context. To briefly illustrate this again, let us

focus on (13)b. For Chierchia, the uninterpretable $[u\sigma, D]$ of *any book* needs to be checked ((14)a is ungrammatical). Once it gets checked by the covert exhaustifier (the only element able to check this feature), it yields a logical contradiction ((14)b).

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

To see this, suppose that the domain quantification is the set of books $\{a, b, c\}$. Then, $[[I \text{ read any book}]]$ denotes $\exists x.[x \in \{a, b, c\} \ \& \ \text{read}(I, x)]$. Now, the domain alternatives of $\exists x.[x \in \{a, b, c\} \ \& \ \text{read}(I, x)]$ are:

- (15) a. $\exists x.[x \in \{a, b, c\} \ \& \ \text{read}(I, x)]$
 b. $\exists x.[x \in \{a, b\} \ \& \ \text{read}(I, x)]$
 c. $\exists x.[x \in \{a, c\} \ \& \ \text{read}(I, x)]$
 d. $\exists x.[x \in \{b, c\} \ \& \ \text{read}(I, x)]$
 e. $\exists x.[x \in \{a\} \ \& \ \text{read}(I, x)]$
 f. $\exists x.[x \in \{b\} \ \& \ \text{read}(I, x)]$
 g. $\exists x.[x \in \{c\} \ \& \ \text{read}(I, x)]$

Apart from (15)a, all domain alternatives in (15) are stronger than $\exists x.[x \in \{a, b, c\} \ \& \ \text{read}(I, x)]$. If EXH applies to $\exists x.[x \in \{a, b, c\} \ \& \ \text{read}(I, x)]$, all non-weaker domain alternatives in (15) must be false.

- (16) $[[\text{EXH}(I \text{ read any books})]] =$
 $[\lambda p.p \ \& \ \forall q \in \text{Alt}(p)[p \not\sqsubseteq q \rightarrow \neg q]](\exists x.[x \in \{a, b, c\} \ \& \ \text{read}(I, x)]) =$

$$\begin{aligned}
& \exists x.[x \in \{a,b,c\} \ \& \ \text{read}(I, x)] \ \& \\
& \neg \exists x.[x \in \{a,b\} \ \& \ \text{read}(I, x)] \ \& \ \neg \exists x.[x \in \{a,c\} \ \& \ \text{read}(I, x)] \ \& \\
& \neg \exists x.[x \in \{b,c\} \ \& \ \text{read}(I, x)] \ \& \ \neg \exists x.[x \in \{a\} \ \& \ \text{read}(I, x)] \ \& \\
& \neg \exists x.[x \in \{b\} \ \& \ \text{read}(I, x)] \ \& \ \neg \exists x.[x \in \{c\} \ \& \ \text{read}(I, x)]
\end{aligned}$$

But the conjunction of all negated stronger domain alternatives entails that there is no element, 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: $\neg \exists x.[x \in \{a\} \ \& \ \text{read}(I, x)] \ \& \ \neg \exists x.[x \in \{b\} \ \& \ \text{read}(I, x)] \ \& \ \neg \exists x.[x \in \{c\} \ \& \ \text{read}(I, x)] \leftrightarrow \neg \exists x.[x \in \{a,b,c\} \ \& \ \text{read}(I, x)]$. But then $[[\text{EXH}(I \text{ read any books})]]$ must have the denotation in (17), which forms a logical contradiction.

$$(17) \quad \exists x.[x \in \{a,b,c\} \ \& \ \text{read}(I, x)] \ \& \ \neg \exists x.[x \in \{a,b,c\} \ \& \ \text{read}(I, x)]$$

For Chierchia, following Gajewski (2002), sentences that are logically contradictory are judged as unacceptable.² If logically contradictory statements indeed trigger unacceptability judgments, the unacceptability of (14)b directly follows.

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

$$(18) \quad \text{I didn't read any book}$$

Again, exhaustification of (18) will result in all non-weaker domain alternatives of (18) being false.

² Note that, for Chierchia, following Gajewski (2002), only logically contradictory expressions are ungrammatical – not just any contradictory expression. An expression is logically contradictory if and only if, under all significant rewritings of its non-logical parts, the contradiction remains, as is the case for unlicensed NPIs of the relevant kind. This is not the case for non-logical contradictions such as *It rains and it doesn't rain*, since one could rephrase the second *rains* with *snow* and the contradiction disappears.

But now, no domain alternative of (18) is actually stronger than (18), due to the fact that the negation reverses the direction of the inferences. Consequently, exhaustification of (18) applies vacuously: $[[\text{EXH}(\text{I didn't read any book})]] = [[\text{I didn't read any book}]]$, and 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 environment, 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, take the non-existing word *pevery* that would be a universal quantifier that carries the same properties that render existential quantifiers NPIs. At first sight, such elements are predicted to be PPIs, with the underlying syntax of (19)b.

- (19) a. I read *pevery* book
b. $[\text{EXH}_{[\text{is}, \text{D}]} [\text{I read } [\text{pevery book}]_{[\text{is}, \text{D}]}]]$

In a positive sentence like (19)b, 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), (20)a 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. $\forall x.[x \in \{a\} \rightarrow \text{read}(I, x)]$

$$f. \quad \forall x.[x \in \{b\} \rightarrow \text{read}(I, x)]$$

$$g. \quad \forall x.[x \in \{c\} \rightarrow \text{read}(I, x)]$$

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

(21) a. I didn't read pevery book

$$b. \quad [\text{EXH}_{[\text{is}, D]} [\text{I didn't read } [\text{pevery book}]_{[\text{us}, D]}]]$$

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

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

$$b. \quad \neg \forall x.[x \in \{a, b\} \rightarrow \text{read}(I, x)]$$

$$c. \quad \neg \forall x.[x \in \{a, c\} \rightarrow \text{read}(I, x)]$$

$$d. \quad \neg \forall x.[x \in \{b, c\} \rightarrow \text{read}(I, x)]$$

$$e. \quad \neg \forall x.[x \in \{a\} \rightarrow \text{read}(I, x)]$$

$$f. \quad \neg \forall x.[x \in \{b\} \rightarrow \text{read}(I, x)]$$

$$g. \quad \neg \forall x.[x \in \{c\} \rightarrow \text{read}(I, x)]$$

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

$$(23) \quad [[\text{EXH}(\text{I didn't read pevery book})]] =$$

$$[\lambda p.p \wedge \forall q \in \text{Alt}(p)[p \not\subseteq q \rightarrow \neg q]](\neg \forall x.[x \in \{a, b, c\} \rightarrow \text{read}(I, x)]) =$$

$$\begin{aligned}
& \neg \forall x.[x \in \{a,b,c\} \rightarrow \text{read}(I, x)] \ \& \\
& \forall x.[x \in \{a,b\} \rightarrow \text{read}(I, x)] \ \& \ \forall x.[x \in \{a,c\} \rightarrow \text{read}(I, x)] \ \& \\
& \forall x.[x \in \{b,c\} \rightarrow \text{read}(I, x)] \ \& \ \forall x.[x \in \{a\} \rightarrow \text{read}(I, x)] \ \& \\
& \forall x.[x \in \{b\} \rightarrow \text{read}(I, x)] \ \& \ \forall x.[x \in \{c\} \rightarrow \text{read}(I, x)]
\end{aligned}$$

The universal counterpart of NPI *any*, given Chierchia's approach, is thus predicted to be a PPI. But languages do not seem to employ such universal quantifier PPIs. Universal quantifiers like English *all*, *everybody* or *everything* can all take scope below negation. However, as Zeijlstra (2017) has argued, 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 (14)b, should be (24).

$$(24) \quad \text{EXH} > \text{DE} > \text{NPI}$$

All other scopal configurations of EXH, DE, and NPI than (24) give rise to either a feature-checking violation (if EXH does not c-command the NPI) or to 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 outscopes the PPI (given the feature-checking requirement of the PI).

$$(25) \quad * \text{EXH} > \text{DE} > \text{PPI}$$

One such configuration that is fine is one where 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, take (28)a again, repeated from (21), but now with the logical form in (27)/(28)b:

- (28) a. I didn't read pevery book
 b. [not [EXH_[σ,D] [I read [pevery book]_[↑σ,↑D]]]]

The exhaustifier in (28)b now 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), (29)a 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 in between the (higher) EXH and the (lower) PPI.

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

At the same time, in any sentence where the exhaustifier, which checks off the uninterpretable feature $[u\sigma, D]$ of a PPI that c-commands a DE operator at surface structure, the PPI may not reconstruct below the DE operator (also, in cases where non-PPIs would be allowed to reconstruct). The reason is that, then, this PPI would end up in the illicit scope configuration (25), which yields a logical contradiction. Those PPIs that are PPIs due to the presence of $[u\sigma, D]$, are thus elements which (i) can appear and take scope under DE operators at surface structure; and (ii) 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 (cf. Zeijlstra 2004, 2017; Abels & Marti 2010). The same also holds for (Levantine/Jordanian) Arabic and Japanese (cf. Zeijlstra 2017).

(30)	Iedereen vertrok niet everybody left not 'Nobody left'	Dutch $\forall > \neg, * \neg > \forall$
------	--	---

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

- (32) Zen'in-ga sono testo-o uke-nakat-ta Japanese
all-NOM that test-ACC take-not-PAST $\forall > \neg; * \neg > \forall$
'Nobody took that test'

Following Zeijlstra (2017), this observation directly follows 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) Speaker A: Iedereen gaat de kamer uit Dutch
everybody goes the room out
'Everybody leaves the room'
- Speaker B: Nee, onzin. Iedereen gaat niet de kamer uit; alleen Jan en Piet
no, nonsense. everybody goes not the room out; only Jan and Piet
'No, nonsense. Not everybody leaves the room, only John and Piet do'

Second, PPIs can scope under negation if a proper intervener scopes between the PPI and its anti-licenser. In a way, we already saw that this is the case for those PPIs that appear under the surface scope of negation (since EXH then acts as an intervener), but more examples of intervention effects can be attested. Example (34) can be true in a situation where it is not always the case that

everybody leaves the room. Note that this reading is facilitated by adding extra stress on *altijd* ('always').

- (34) Iedereen gaat niet altijd de kamer uit Dutch
everybody goes not 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) Ik zeg niet dat iedereen vertrekt; alleen Jan vertrekt Dutch
I say not that everybody leaves; only Jan leaves
'I'm not saying that everybody leaves; only John leaves'

Fourth, and finally, (weak) PPIs can be rescued under two anti-licensors (with the highest one being a non-Anti-Additive anti-licensor). Again, this is the case for Dutch *iedereen*. Take (36). The most salient reading of this sentence is the one where the speaker is surprised that some people left (i.e., that not everybody stayed). Again, this reading is only possible if *iedereen* is allowed to reconstruct under negation.

- (36) Het verbaast me dat iedereen niet blijft Dutch
it surprises me that everybody not 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*

Looking at the Korean data, now 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 follows, again following Hagstrom (2000, 2002) who argues that objects in Korean always raise from a VP-internal position to a VP-external position:

$$(37) \quad [_{IP} \quad [_{FP} \text{OB}_i [_{NegP} \quad [_{VP} <\text{OB}_i> \text{V}] \text{NEG}] \text{F}] \text{I}]$$

Now, let's see what happens if the object is a universal quantifier. In Variety I, the object can but does not have to reconstruct. This correctly predicts that in Variety I, both the construal $\neg > \forall$ and $\forall > \neg$ 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.

In order to assess the correctness of this analysis, three predictions this analysis makes need to be further tested. First, it is predicted that if a universal quantifier in Koreans appears below negation at surface structure, it should be allowed to take scope below negation as well. Second, it is predicted that if the universal quantifier appears in contexts that allow PPIs to take scope below negation, it should indeed take narrow scope with respect to it. And third, whereas the analysis based on head movement does not distinguish between the type 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 this 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 indeed confirmed. If the sentence contains a negatively marked

subject, as in (38), the universal quantifier object indeed takes scope below negation. The only reading (38) has, in both varieties, is the one where nobody read every book.

- (38) Amwuto motun chayk-ul an ilk-ess-ta
 anybody every book-Acc neg read-Past-Decl
 ‘Nobody read every book’ (HLM07: (17a))

The second prediction is born out as well. As shown below, whenever the combination of a negation and an universal quantifier is embedded in a non-anti-additive, DE context, all of the sudden the construal $\neg > \forall$ becomes available in Variety II as well. This is shown for *only*, *few N* and *at most N* below.

- (39) a. John-man-i motun chayk-ul an ilk-ess-ta
 John-only-nom every book-acc neg read-past-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-past-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 class.-gen student-pl-nom every book-acc neg read-past-decl
 ‘At most 3 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 expressions, such as *many N*, *exactly 3 N* or *most N*, does not change the scopal construal between the negation and the object, as shown in (40).

- (40) a. John-i manhun chayk-ul an ilk-ess-ta.
 John-nom many book-acc neg read-past-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-past-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-past-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 in (41) 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 & Spector (2012), is that inverse scope must be entailed by the surface scope in order for it 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 third 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 Variety I and II. These other expressions simply cannot reconstruct below negation, even though the universal quantifier can. Under Han et al.’s account, by contrast, these should all take narrow scope with respect to negation as they all surface below it. Indeed, both speakers of Variety I and II assign the same readings to the examples in (40), thus confirming the third prediction as well – under Han’s et al.’s approach these readings are predicted to be unavailable.

4. Consequences

The Korean facts can thus be better, simpler and more adequately explained by simply 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 already saw for universal quantifier subjects. And also with respect to other elements, variation with respect to polarity-sensitivity is attested. For instance, as has been pointed out by Israel (1996), Iatridou & Zeijlstra (2010, 2013), and Homer (2015), universal modals that take wide scope with respect to sentential negation, like English *must*, *should* or *ought to* should be analysed as PPIs.

- (43)
- | | | |
|----|------------------------|---------------|
| 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 analysed as PPIs is that only these modal auxiliaries outscope negation. Other modals auxiliaries, existential modals and other universal modals alike, in principle, take scope under negation:

- (44)
- | | | |
|----|---------------------------|---------------|
| a. | She doesn’t have to leave | $\neg > \Box$ |
|----|---------------------------|---------------|

- (45)

German *müssen*, a cognate of English *must*, scopes below negation:

- (46)

languages.

like Japanese and Korean.

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