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1 Introduction

This paper develops a theory of intervention effects for WH in-situ languages that reduces them to clause structure properties which are plausibly detectable by learners on the basis of overt morphology.

The intervention effect (IE) arises when a quantifier (Q) intervenes between WH in-situ and a scope position, viz. $C^{o}_{[+WH]}$, rendering the whole question ungrammatical or prohibiting the WH from taking (matrix) scope over the intervening quantifier (See Beck 1996, Beck and Kim 1997, a.o.).

(1) a. *Amwu-to mwues-ul sa-ci anh -ss -ni?
Anyone (NPI) what-ACC buy-NEG -PST -Q
b. Mwues-ul amwu-to __ sa-ci anh-ss-ni?[1]
'What did no one buy?'

In (1a), an in-situ WH, *mwues-ul*, cannot be licensed in the c-command domain of Q, e.g., *amwu-to* 'anyone (Negative Polarity Item)'. Instead, the WH must move across the intervening Q to get proper interpretation, as in (1b).

Two related issues surrounding IE can be raised. First, phenomena superficially similar to IE occur across in-situ strategy languages (German, French, Korean, etc.), but they show a contrast in permitted interpretations and in permitted well-formed structures of WH questions. Moreover, the class of interveners varies depending on the language. Second, in relation to learning issues, intra- and cross-linguistic variation regarding IEs poses a puzzle: how can learners come to know very diverse and subtle linguistic facts, without any plausible direct instruction?

This paper attempts to provide answers regarding the abovementioned issues. Assuming invisible question operator movement out of in-situ WH

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[1]When the WH moves across the intervening Q, the whole question becomes improved, whatever movement it may involve (scrambling, focus movement or WH movement), but I claim that there exists syntactic WH movement in Korean type in-situ languages, independently of scrambling or focus fronting. See Kim (2005) for the elaborated arguments.

(as in Watanabe 1992, for example)[2], we propose that IEs can be reduced to Rizzi's (1990, 1992) Minimality effects, under the enriched clausal architecture provided by the syntax of Quantificational (Q-) particles (Lee 2004). Q-particles, e.g., *-to* in *amwu-to* 'anyone (NPI)', project an autonomous functional phrase like Rizzi's (1992) NegP to host an intervening quantifier in the spec position, thus blocking antecedent government between a moved invisible WH operator and the offending non-referential trace. That is, the IE arises because the filled specifier of a particle projection is regarded as a potential A-bar intervening governor.

We also suggest a linguistic parameter that determines the class of interveners, X: either X fills the A-bar spec of a quantificational head in clausal architecture (e.g., Korean) or X is an A-bar adjunct in clausal structure (e.g., French). Perhaps languages can differ as to what quantificational structures look like and to what extent quantification can be dealt with in overt syntax.

The rest of the discussion is organized as follows: section 2 shows the data regarding IEs in Korean. This will be followed by a brief review of Rizzi's (1992) intervention theory in section 3. Section 4 addresses the syntax of Q-particles. We extend the proposed A-bar intervention theory to cross-linguistic data in section 5.

2 Korean Interveners

The full class of Korean interveners has yet to be clearly defined. Obviously, *-to* NPIs, for instance, *amwu-to/nwukwu-to* 'anyone', *nwukwu-eykey-to* 'to anyone' and *eoty-seo-to* 'at anywhere', give rise to the IE when combined with the sentence negator, *anh* 'do not'. The interveners are not limited to negation alone, but not all SBEs are interveners (Hoji 1985, Kim 1991, etc.). In spite of their negative force, neither the sentence negative *-anh* 'not do' alone nor negative adverbs like *kyeolko* 'never' and *ceonhyeo* 'not...at all' are interveners.[3] Unlike *amwu-to/nwukwu-to* 'anyone', negative adverbs are event modifiers and hence optional in the syntactic structure.

The universal term *motun* (Korean), like *minna* (Japanese) 'all', does not trigger IE, since unlike English *every*, it lacks the 'distributive' property

[2]See Cole and Hermon (1994) for two types of in-situ languages. The first type (Japanese WH in-situ) respects movement constraints. The WH in-situ of the second type (Malay, Ancash Quechua) is interpreted in-situ without movement.

[3]Sentential negation alone is not enough to form a boundary to block antecedent government in Korean and the presumed null negative operator, which is allegedly in spec of NegP (Rizzi 1992), cannot block either. Adverbs of quantification in general, e.g., *cacwu* 'often', *hangsang* 'always', do not count as interveners (cf. Beck and Kim 1997).

and thus is not a genuine universal quantifier (Hoji 1985, Kim 1991).

(2) **Motun** saram-i / **motwu**-ka mwues-ul sass -ni?
All people-NOM / all-NOM what-ACC bought -Q
'What did all the people buy?'

Regardless of their semantic properties, such as belonging to the class of strong or weak quantifiers and monotonicity, particle-attached quantifiers can only serve as interveners. This is the generalization we have arrived at.

Weak Quantifier	Strong Quantifier
motwu/motun 'all'	*manhi* 'many, much, a lot'
cakcha 'each'	Numeral(num)-classifier (cl)
taypwupwun 'most'	*myoet*-cl 'several/how many-cl'
**amwu-to* 'anyone'	*ceokeoto* num-cl 'at least num-cl'
**nwukwu-na* 'everyone'	*kikkethaya* num-cl 'at most num-cl'
twulta 'both'	**nwukwu-nka* 'someone'

Table 1: Korean Quantifiers (* indicates the interveners)

Together with the negative *-to*, the distributive universal *-na* and the indefinite *-(n)ka*, marked in table 1, the exclusive focus *-man* phrase (e.g., *John-man* 'only John') and the additive focus *-to* phrase (e.g., *John-to* 'John also') jointly constitute the intervener class.

(3) a.***John-man/-to** mwues-ul sa-ss -ni?
John-only/-also what-ACC bought-Q
b.√mwues-ul **John-man/-to** sa-ss -ni?
What-ACC John-only/-also bought-Q
'What did only John buy /what did John buy, too?'

To sum up, what exactly is the class of offending quantifiers that block the licensing of WH in-situ in Korean? All and only Q-particle bearing elements can intervene in the link between in-situ WH and a scope position.

3 Rizzi's (1992) A-bar Intervention Theory[4]

Rizzi (1992) suggests a configurational approach to the IE attested in German partial WH movement. His account crucially relies on the presence of a null negative operator in [Spec NegP].

(4) a. Partial WH Move: move to the embedded [Spec C]:
Was glaubst du (*nicht), **mit wem** Hans t gesprochen hat?
WHAT do(n't) you believe with whom Hans has spoken?
b. Long WH Move:
Mit wem glaubst du (nicht), dass Hans t gesprochen hat?
With whom do(n't) you believe that Has has spoken?

Partial WH movement is blocked by an intervening negation, while full movement is not. A hypothetical null operator is posited to be in spec of an autonomous negative projection, NegP (Pollock 1989, Belletti 1990, and much subsequent work). Thus, a filled [spec NegP], viz., a potential A-bar intervening governor, intervenes in the non-referential chain link (*was, mit wem*). However, Rizzi's (1992) intervention theory, without any modifications, cannot be extended to the Korean data, since in Korean, sentence negation alone, without overt NPIs, does not induce the IE.

4 The Proposed Analysis: Null Operator Movement and Particle Projection

This section presents a syntactic account for the quantificational intervention effect on the licensing of WH in-situ in Korean. We assume (i) the syntax of Q-particles (Lee 2004 on focus particles) and (ii) null WH operator movement (Watanabe 1992, etc.).

4.1 The Syntax of Q-particles

Korean Q-particles (affix-like), such as the exclusive *-man* 'only', the additive *-to* 'also', the distributive universal *-na* 'every', the indefinite existential *-(n)ka* and the negative *-to* 'even (under negation)', are agreement morphemes on the specifier that indicate the quantificational force of the null quantifier head. Just as a WH (or a null WH operator alone) stands in a spec-

[4]See Kim (2006) for the problems previous analyses pose with regard to the intervention effect in Korean.

head relation with a $C^{o}_{[+WH]}$, a Q-particle attached intervener also enters into a spec-head relation with the associated abstract head (Lee 2004). Particle heads are merged in clausal structure, not in DP structure (cf. Koopman 2005). The evidence comes from multiple specifiers. As Kuroda (1992) has pointed out, the Japanese/Korean agreement system permits multiple specifiers of a single head. A straightforward example is based on inalienable possession constructions.

(5) Multiple subject or nominative construction:
a. Mary-ga kami-ga nagai (Japanese)
M-NOM hair-NOM long
b. Mary-ka meori-ka kilta (Korean)
M-NOM hair-NOM long
'Mary has long hair.'

Just as the nominative or accusative case marker indicates the presence of a T or AgrO head and it is multiply assigned or checked in A-spec positions of the agreement head, multiple positions are also expected to be available as A-bar specifiers to host Q-particle attached phrases. This is borne out.

(6) **The exclusive focus *-man* 'only':**
John-**man** sakwa-**man** mekesse (Lee 2004)
John-MAN apple-MAN ate
'Only John ate only apples.'
(i) John is the only one who ate only apples.
(ii) John is the only one who ate anything, and John ate only apples.

The sentence in (6) is ambiguous. On the second reading in (6), the pair <John, apple> is the only element that satisfies the eating relation. According to Lee's (2004) null quantificational head analysis, this reading is available only when the hypothetical head bears the exclusive meaning. The first reading, in contrast, contains two distinct exclusive meanings, each of which is due to the occurrence of the particle *-man*.

(7) **The additive focus *-to* 'also':**
John-**to** sakwa-**to** mekesse. (Lee 2004)
John-TO apple-TO ate
'(Lit.) John-also ate apples-also.'
(i) Someone who is not John ate apples in addition to something else, and John also ate apples in addition to something else.

(ii) *Someone who is not John ate something that is not apples. In addition to this, John ate apples.

The first construal in (7) is due to two distinct presuppositions triggered by the particle *-to*. The second reading is not available, which is expected to arise only when the hypothetical ALSO head is assumed to carry the additive meaning. In this regard, the particles *-to* and *-man* differ. That is, the additive meaning can be on the particle *-to* itself, not on the phonetically empty ALSO head. However, despite the difference in the locus of the quantificational meaning, we assume the particles *-to* and *-man* share the same syntax.

A similar pattern holds for the negative particle *-to*. Consider:

(8) **The negative *-to* 'even' under negation:**
Amwu-**to** amwu kes-**to** meok-ci anh-ass -ta. (Sells 2001)
Anyone-TO anything-TO eat -NEG -PST -DEC
'No one ate anything.'

The iterative negative *-to* in (8) does not give rise to double negation meaning. Rather, as in negative concord languages like French, two negations associated with the particle *-to* do not cancel out each other, but yield single negation, i.e., concord meaning. Multiple occurrence of the negative *-to* in (8) implies that the syntax of the previous particles can carry over to the negative *-to*, whether the corresponding null head carries the meaning or it is just a pure licensing head.

The application of the null head hypothesis can extend to the syntax of the distributive universal *-na*:

(9) **The distributive universal *-na*:**
Nwukwu-na eonu kwuaca-na coahan-ta
Who -NA which snack -NA likes -DEC
'Everyone likes every snack.'
(i) For each x, x likes every snack.
(ii) All the possible pairs out of the two sets satisfy the 'like' relation.

The two readings in (9) are indistinguishable: regardless of whether the distributive meaning is on the null head or on the particle itself, the two meanings of *-na* collapse into one single distributive meaning.

Lastly, the existential *-(n)ka* can also occur iteratively by attaching to two different arguments.

(10) **The existential *-(n)ka*:**
Nwukwu-nka-ka mwues-nka-lul mekessta
Who -(n)KA-NOM what -(n)KA-ACC ate
'Someone ate something.'

Provided that quantificational particles are treated as syntactic entities which are merged in overt syntax, we predict that indefinite *-(n)ka* and distributive universal *-na* marked phrases are eligible to figure in the syntactic relations that overt syntactic movement establishes.

Now, let us turn to other syntactic and morphological properties Q-particles share. As already shown above, Q-particles typically attach to lexical NPs or indefinite expressions such as indefinite WH *amwu* 'any', thus imposing different quantificational forces as well as different syntactic functions onto their combinations.

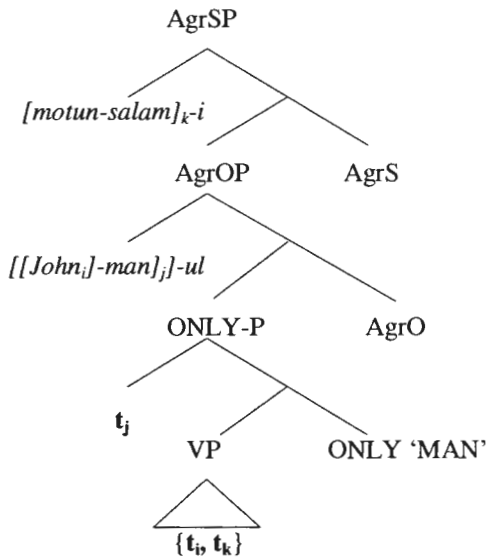
First, the spec of the particle projection is filled by movement, that is, word structure is derived in the syntax and the derivation steps to form a Q-particle phrase should obey the Mirror Principle (Baker 1985).[5] Hence, a specific linear order among nominal affixes (Q-particles, case markers and postpositions) is a natural consequence of the syntactic derivations, each of which attaches an affix to a host phrase, the former merging into the spec of the corresponding projection (See Lee 2004).

(11) Motun-salam-i John-**man-ul** salanghanta.
All-person-NOM J-MAN-ACC loves
'Everyone loves John and no one else.'

A null ONLY head should be merged lower than the case-related head, e.g. AgrO, which in turn is merged below AgrS. To derive the surface order in (11), the particle *-man* forms a constituent with a host phrase, *John*, at the spec of the head ONLY into which the host phrase, *John*, moves from the VP internal position to pick up the particle *-man*. This is illustrated in (12).

[5]The Mirror Principle (Baker 1985): Morphological derivations must directly reflect syntactic derivations, and vice versa. For example, in a combination of the form [Noun - affix A - affix B . . .], the order in which morphemes appear on the base noun reflects the order in which the morphological processes that add those morphemes apply. That is, the process that adds affix A precedes the process that adds affix B.

(12)



This raises the questions of when and where the Q-particle heads are merged. Q-particle projections can spread around case-related heads, AgrS and AgrO (cf. Koopman's 2005 case heads: Nom or Acc), i.e., they can be merged in low or high positions, as long as a Q-head or a Q-particle satisfies its lexical meaning definition, whether the null head carries the meaning or it is just a pure licensing head, which is semantically vacuous.

Next, Q-particles follow postpositions, but precede case markers (*-i/-ka* for nominative vs. *-(l)ul* for accusative).

(13) a. John-**man-(i)** /*John-**i-man** keoki-ey ka-ss-ta
J-MAN-NOM / J-NOM-MAN there-LOC went
'Only John went there.'
b. Mary-ka ku chayk-**man-(ul)** /*ku chayk-**ul-man** ilk-ess-ta
M-NOM that book-MAN-ACC/that book-ACC-MAN read
'Mary read only that book/Mary read that book, too.'

(14) a. Nwukwu-**nka-(ka)**/nwukwu-**na-(ka)** ku chayk-ul ilk-ess-ta
Who-NKA-NOM / who-NA-NOM that book-ACC read
'Someone read that book/everyone read that book.'
b. Mary-ka nwukwu-**nka-(lul)**/nwukwu-**na-(lul)** manna-ss-ta
M-NOM who-NKA-ACC /who-NA-ACC met
'Mary met someone/Mary met everyone (or every person).'

In (13)-(14), the Q-particle is suffixed first to a base before the case marker is added, as long as the case is overtly marked. The reverse order is not allowed, e.g., **nwukwu-lul-{man/-na}* 'only who/everyone (object)'. Postpositions, unlike case markers, precede Q-particles:

(15) a. Mary-nun John-***(hako)-man** /*John-**man-hako** nonta
M-TOP John -with -MAN/ John-MAN-with play
'Mary plays only with John.'
b. Mary-ka John-***(eykey)-man** /*John-**man-eykey** sakwahayssta
M-NOM John-to -MAN/ John-MAN-to apologized
'Mary apologized only to John.' (Lee 2004)

(16) Mary-ka amwu-haksayng-***(eykey)-na** /*amwu-haksayng-**ina-eykey**
M-NOM any -student -to -NA/ any -student -NA-to
senmwul-ul cwuessta
present-ACC gave
'Mary gave a gift to every student (regardless of whoever he is).'

The particle orderings in (15)-(16) can also follow from a syntactic tree like (12), where we assume the postpositional phrase is generated at the VP level.

4.2 The Negative Particle *-pakkey* 'except'

The negative particle *-pakkey* 'except, any x other than' (corresponding to Japanese *-sika*) has a dual aspect of focus and negation. Due to the negativity it bears, *-pakkey* is expected to pattern like *-to* NPIs. This is borne out:[6]

(17) a. John-man ku chayk pakkey/ amwu ckayk-to sa-ci anh-ass-ta
J -MAN that book PAKKEY any book-TO buy-NEG-PST-DEC
b. *ku chayk pakkey/ amwu chayk-to John-man sa-ci anh-ass-ta
that book PAKKEY/any book-TO J-MAN buy-NEG-PST-DEC
'John is the only person who bought only that book/John is the only person who did not buy any books.'

We assume that *-pakkey*, unlike *-to* 'even' in NPIs, is an adverbial particle. Hence, it is not an intervener: it does not project its own phrase, but just helps us to detect the position of an implicit argument *-to* NPI whose projection blocks invisible question operator movement out of WH in-situ. That is,

[6]For the details of the hierarchical ordering among Q-particles, see Kim (2006). (17b) is ruled out, since according to Kim (2006), the negative *-to* should be placed in between high and low focus loci and the caseless *-man* phrase is assumed to be in the spec of a high focus MAN projection.

it is not the *-pakkey* phrase, but the adjacent *-to* NPI, which is optionally realized, that induces an intervention effect:

(18) *John **pakkey (amwu-to)** nwukwu-lul chotaeha-ci anh-ass-ni?
J PAKKEY anyone-TO who-ACC invite -NEG -PST-Q
'Whom did no one except John invite (whom did only John invite)?'

In (18), the *-pakkey* phrase signals the position of the *-to* NPI, which is the real argument of the verb.

4.3 The A-bar Property of the Spec of Q-particle Phrases

This section presents another characteristic Q-particle projections share: the A-bar property of the spec position. This is important for our account since under Rizzi's (1990) Relativized Minimality, only A-bar elements are potential interveners in antecedent government of a WH chain. A diagnostic can be created with respect to Weak Crossover. The sentence initial *-na* phrase is base-generated at the spec of the distributive projection. Observe the contrast:

(19) a. **Chelswu-ekey$_k$** [**ku-ui$_k$** eomeoni]-ka **t$_k$** seonmwul-ul cwuessta
Chelswu-to his mother-NOM _ gift-ACC gave
'To Chelswu, his mother gave a gift.' (A-scrambling)
b. ***Nwukwu-ekey$_k$-na** [**ku-ui$_k$** eomeoni]-ka **t$_k$** seonmwul-ul cwuessta
who -to -NA his mother -NOM _ gift-ACC gave
'(Lit.) To everyone$_k$, his$_k$ mother gave a gift.' (A-bar scrambling)

The *-na* phrase in (19b) can get to the surface position either by base-generation of *-na* or by A-bar scrambling of the entire *-na* phrase, but fails to bind a pronoun in the subject. Hence, a WCO violation arises, since we are claiming that the spec of distributive-P is an A-bar position. By contrast, the PP in (19a) undergoes clause-internal A-scrambling, thus creating a new binding possibility.

4.4 Intervention under the Quantificational Head Hypothesis

Assuming both the syntax of Q-particles and invisible question operator movement, we can explore the intervention effect as follows: the IE arises whenever a Q-particle attached phrase (A-bar element) c-commands a WH in-situ and intervenes in a non-referential WH chain, which is created by null question operator movement to a scope position.

Genuine universal terms like *-na* phrases count as interveners in Korean, since unlike their German counterpart *jeder* (Beck 1996) or Chinese *dou* expressions (Cheng 1991), they are regarded as a syntactic entity directly merged into an A-bar spec in overt syntax.

5 Typology

In this section, we extend the particle projection and A-bar intervention theory proposed in section 4 to other in-situ strategy languages.

5.1 French Interveners

French alternates the in-situ construction with WH extraction in matrix clauses. However, when an intervener comes between in-situ WH and spec C, WH extraction is obligatory. The language has a wide range of interveners, only part of which overlaps with Korean interveners: negation, adverbs of quantification like *toujours* 'always', *souvent* 'often', the universal quantifier *tout le monde* 'everyone', focus phrases like *seulement* 'only'-NP, etc.[7]

(20) Negation:
a.*Jean ne mange pas **quoi**?
Jean NEG eat NOT what
b. Qu'est que Jean ne mange pas __?
What that Jean NEG eat NOT
'What doesn't John eat?

(21) Universal quantifier:
*Tout le monde a vu **quoi**?
All the world has seen what
'What did everyone see?'

As observed in (21), the French universal quantifier, *tout le monde*, does not seem to license in-situ WH in matrix clauses. According to the literature (Mathieu 1999, among others), French interveners are in adjoined positions in overt syntax. If the adjunction sites are regarded as valid A-bar positions that affect A-bar dependencies, the intervention effect in French can also be reduced to Rizzi's (1990) Minimality effects, with the help of a linguistic parameter with regard to intervening A-bar positions, as in (22).

[7]See Cheng and Rooryck (2000), among others. They assume LF WH feature movement by which licensing is supposed to take place.

(22) A linguistic parameter w.r.t. intervening A-bar positions:
Interveners are A-bar specifiers or A-bar adjuncts in clausal structure.

According to (22), French interveners are A-bar adjuncts, rather than A-bar specifiers.

5.2 Chinese Interveners

In Chinese, ordinary quantifier NPs, frequency adverbials and negation do not exhibit intervention effects (Huang 1982, Aoun & Li 1993, Kim 2001). However, focus phrases like *zhiyou-NP* 'only N' or *ye* 'also'-phrases including NPIs induce an intervention effect:

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

(24) **WH-*ye*** 'anyone, anything, etc.' NPIs:
a.***shei-ye*** kan bu dong na -ben shu? (*shei ye* 'anyone')
Who-also read not understand which-CL book
b. Na-ben shu **shei ye** kan bu dong?
'Which book could no one understand?'

Unlike Korean, Chinese has fixed word order. However, when an IE occurs, WH in-situ has to front to the sentence initial position, regardless of what kind of movement it may undergo.

The Chinese universal quantifier is a combination of WH / *mei*-NP 'every-NP' and *dou*. For instance, the sequence [WH-*dou*] is interpreted as a universal quantifier, 'every N'. It does not induce an intervention effect:

(25) Universal quantifier:
Meigeren **dou** mai-le **shenme**?
Everyone all buy-ASP what
'What did everyone buy?'

Syntactically, Chinese *dou* 'all/every' is an adverb, base-generated as an adjunct to an X' (V'). Semantically, like the Korean particle *-na*, it is a distributor (Cheng 1991). Therefore, it is concluded that Chinese *dou* is a distributive adverb and in Chinese, particle attached phrases (e.g., NPI and focus phrases), as opposed to universal quantifiers and run-of-the-mill quanti-

fiers, serve as interveners. Furthermore, if languages actually vary according to the parameter in (22), then the value of Chinese, on a par with Korean, might be set to A-bar specifier, not to adjunct position.

6 Conclusion

This paper presented a syntactic account for the quantificational intervention effect on the licensing of WH in-situ. We have shown that A-bar intervention theory, a so-called articulated landing site theory, coupled with null question operator movement and the syntax of quantificational (Q-) particles, can reduce intervention effects in in-situ languages like Korean to Rizzi's (1990, 1992) Minimality effects. The syntax of Q-particles posits a Q-particle to be licensed in the spec of the associated functional phrase via spec-head relations. We also showed that the proposed intervention theory can extend to other in-situ languages, by adding a linguistic parameter that determines the class of interveners: either an intervener fills the A-bar spec of a quantificational head (e.g. Korean and Chinese) or it is an A-bar adjunct (e.g. French) in clausal structure.

In terms of language acquisition, the intervention effects are more easily predicted under particle projection theory, since we treat them in overt syntax, putting the idiosyncratic morphology into the rigid syntax of Q-particles. Lastly, NPIs are considered universal interveners probably because they invariably appear in certain syntactic positions, i.e. either in the spec of NegP in some languages or in the spec of the negative particle projection in others.

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