

Chapter 19

Negation

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Each language has a way to express (sentential) negation that reverses the truth value of a certain sentence, but employs language-particular expressions as well as grammatical strategies. There are four main types of negative in expressing sentential negation: adverbial negative, morphological negative, auxiliary negative verb, and preverbal negative. This chapter discusses HPSG analyses for these four strategies in marking sentential negation.

1 Modes of expressing negation

There are four different types of negative markers in expressing negation in languages: morphological negative, auxiliary negative verb, adverbial negative, and clitic-like preverbal negative (see Dahl 1979; Payne 1985; Dryer 2005). Each of these types is illustrated in the following:¹

- (1) a. Ali elmalar-i ser-me-di-Ø. (Turkish)
Ali apples-ACC like-NEG-PST-3SG
'Ali didn't like apples.'
- b. sensayng-nim-i o-ci anh-usi-ess-ta. (Korean)
teacher-HON-NOM come-CONN NEG-HON-PST-DECL
'The teacher didn't come.'
- c. Dominique (n')écrivait pas de lettre. (French)
Dominique wrote NEG of letter
'Dominique did not write a letter.'

¹The non-standard abbreviations used here include CONN (connective), DEL (delimiter), HON (honorific), NPST (nonpast), PERF (perfective), PRES (present), and so forth.



- d. Gianni non legge articoli di sintassi. (Italian)
Gianni NEG reads articles of syntax
'Gianni doesn't read syntax articles.'

As shown in (1a), languages like Turkish have typical examples of morphological negatives where negation is expressed by an inflectional category realized on the verb by affixation. Meanwhile, languages like Korean employ a negative auxiliary verb as in (1b).² The negative auxiliary verb here is marked with the basic verbal categories such as agreement, tense, aspect, and mood, while the lexical, main verb remains in an invariant, participle form. The third major way of expressing negation is to use an adverbial negative. This type of negation, forming an independent word, is prevalent in English and French, as given in (1c). In these languages, negatives behave like adverbs in their ordering with respect to the verb. The fourth type is to introduce a preverbal negative in expressing sentential negation. The negative marker in Italian in (1d), preceding a finite verb like other types of clitics in the language, belongs to this type.

In analyzing these four main types of sentential negation, there have been two main strands: derivational vs. nonderivational views. The derivational view has claimed that the positioning of all of the four types of negatives is basically determined by the interaction of movement operations, a rather large set of functional projections including NegP, and their hierarchically fixed organization.³ In particular, to account for the fact that unlike English, only French allows main or lexical verb inversion as in (1c), Pollock (1989; 1994) and a number of subsequent researchers have interpreted these contrasts as providing critical motivation for the process of head movement and the existence of functional categories such as MoodP, TP, AgrP, and NegP (see Belletti 1990; Zanuttini 1991; 1997; 2001; Chomsky 1991; 1993; 1995; Lasnik 1995; Haegeman 1995; 1997; Vikner 1997; Zeijlstra 2015). Within the derivational view, it has thus been widely accepted that the variation between French and English can be explained only in terms of the respective properties of verb movement and its interaction with a view of clause structure organized around functional projections.

Departing from the derivational view, the non-derivational, lexicalist view requires no uniform syntactic category (e.g., Neg or NegP) for the different types of negatives. This view allows negation to be realized in different grammatical

²Korean is peculiar in that it has two ways to express sentential negation: a negative auxiliary (a long form negation) and a morphological negative (a short form negation) for sentential negation. See Kim (2000; 2016) and references therein for detail.

³The term "negator" or "negative marker" is a cover term for any linguistic expression functioning as sentential negation.

categories, e.g., a morphological suffix, an auxiliary verb, or an adverbial expression. For instance, the negative *not* in English is taken to be an adverb like other negative expressions in English (e.g., *never*, *barely*, *hardly*). This view has been suggested by Jackendoff (1972), Baker (1991), Ernst (1992), Abeillé & Godard (1997), Kim (2000), and Warner (2000). In particular, Kim & Sag (1996), Abeillé & Godard (1997), Kim (2000), and Kim & Sag (2002) develop analyses of sentential negation in English, French, Korean, and Italian within the framework of HPSG, showing that the postulation of Neg and its projection NegP creates more empirical and theoretical problems than it solves (see Newmyer 2006 for this point). In addition, there has been substantial work on negation in other languages within the HPSG framework, which does not resort to the postulation of functional projections or movement operations to account for the various distributional possibilities of negation (see Przepiórkowski & Kupść 1999; Borsley & Jones 2000; Przepiórkowski 2000; Kupść & Przepiórkowski 2002; De Swart & Sag 2002; Borsley & Jones 2005; Crowgey 2010; Bender & Lascarides 2013a).

In what follows, I review the HPSG analyses of these four main types of negation, focusing on the distributional possibilities of these four types of negatives in relation to other main constituents of the sentence. When necessary, the chapter also discusses implications for the theory of grammar.⁴ I start with the HPSG analyses of adverbial negatives in English and French, which have been most extensively studied in transformational grammars. The chapter then moves to the discussion of morphological negatives, negative auxiliary verbs, and preverbal negatives. The chapter also reviews the HPSG analyses of phenomena like genitive negation and negative concord which are sensitive to the presence of negative expressions. The final section concludes this chapter.

2 Adverbial negative

2.1 Two key factors

The most extensively studied type of negation is the adverbial negative, which we find in English and French. There are two main factors that determine the position of an adverbial negative: the finiteness of the verb and its intrinsic properties, namely whether it is an auxiliary or a lexical verb (see Kim 2000; Kim & Sag 2002).⁵

⁴This chapter grows out of Kim (2000; 2018).

⁵German also employs an adverbial negative *nicht*, which behaves quite differently from the negative in English and French. See Müller (2016) for a detailed review of the previous theo-

The first crucial factor that affects the position of adverbial negatives in English and French concerns the finiteness of the lexical verb. English shows us how the finiteness of a verb influences the surface position of the adverbial negative *not*:

- (2) a. Kim does not like Lee.
b. * Kim not likes Lee.
c. * Kim likes not Lee.
- (3) a. Kim is believed [not [to like Mary]].
b. * Kim is believed to [like not Mary].

As seen from the data above, the negation *not* precedes an infinitive verb, but cannot follow a finite lexical verb (see Baker 1989; 1991; Ernst 1992). French is not exceptional in this respect. The finiteness also affects the distributional possibilities of the French negative *pas* (see Abeillé & Godard 1997; Kim & Sag 2002; Zeijlstra 2007):

- (4) a. Robin n'aime pas Stacy.
Robin (n')likes NEG Stacy
'Robin does not like Stacy.'
b. * Robin ne pas aime Stacy.
- (5) a. Ne pas parler Français est un grand désavantage en ce cas.
ne NEG to.speak French is a great disadvantage in this case
'Not speaking French is a great disadvantage in this case.'
b. * Ne parler pas Français est un grand désavantage en ce cas.

The negator *pas* cannot precede the finite verb but must follow it. But its placement with respect to the nonfinite verb is the reverse image. The negator *pas* should precede the infinitive verb.

The second important factor that determines the position of adverbial negatives concerns the presence of an auxiliary or lexical verb. Modern English displays a clear example where this intrinsic property of the verb influences the position of the English negator *not*: the negator cannot follow a finite lexical verb, but when the finite verb is an auxiliary verb, this ordering is possible.

- (6) a. * Kim left not the town.
b. Kim has not left the town.

retical analyses of German negation.

- c. Kim is not leaving the town.

The placement of *pas* in French infinitival clauses also illustrates that the intrinsic property of the verb affects the position of the adverbial negative *pas*:

- (7) a. Ne pas avoir de voiture dans cette ville rend la vie difficile.
'Not having a car in this city makes life difficult.'
b. N'avoir pas de voiture dans cette ville rend la vie difficile.
- (8) a. Ne pas être triste est une condition pour chanter des chansons.
'Not being sad is a prerequisite condition for singing songs.'
b. N'être pas triste est une condition pour chanter des chansons.

The negator *pas* can either follow or precede the infinitive auxiliary verb in French, though the acceptability of the ordering in (7b) and (8b) is restricted to certain conservative varieties.

In capturing the distributional behavior of such adverbial negatives in English and French, as noted earlier, the derivational view (exemplified by Pollock 1989 and Chomsky 1991) has relied on the notion of verb movement and functional projections. The most appealing aspect of this view (initially at least) is that it can provide an analysis of the systematic variation between English and French. By simply assuming that the two languages have different scopes of verb movement – in English only auxiliary verbs move to a higher functional projection, whereas all French verbs undergo the same process – the derivational view could explain why the French negator *pas* follows a finite verb, unlike the English negator. In order for this system to succeed, nontrivial complications are required in the basic components of the grammar, e.g., rather questionable subtheories (see Kim 2000 and Kim & Sag 2002 for detailed discussion).

Meanwhile, the nonderivational, lexicalist analyses of HPSG license all surface structures by the system of phrase types and constraints. That is, the position of adverbial negatives is taken to be determined not by the respective properties of verb movement, but by their lexical properties, the morphosyntactic (finiteness) features of the verbal head, and independently motivated Linear Precedence (LP) constraints, as we will see in the following discussion.

2.2 Constituent negation

When English *not* negates an embedded constituent, it behaves much like the negative adverb *never*. The similarity between *not* and *never* is particularly clear

in nonfinite verbal constructions (participle, infinitival, and bare verb phrases), as illustrated in (9) and (10) (Klima 1964; Baker 1989; 1991).

- (9) a. Kim regrets [never [having read the book]].
 b. We asked him [never [to try to read the book]].
 c. Duty made them [never [miss the weekly meeting]].
- (10) a. Kim regrets [not [having read the book]].
 b. We asked him [not [to try to read the book]].
 c. Duty made them [not [miss the weekly meeting]].

French *ne-pas* is no different in this regard. *Ne-pas* and certain other adverbs precede an infinitival VP:

- (11) a. [Ne pas [repeindre sa maison]] est une négligence.
 ne not paint one's house is a negligence
 'Not painting one's house is negligent.'
- b. [Régulièrement [repeindre sa maison]] est une nécessité.
 regularly to paint one's house is a necessity
 'Regularly painting one's house is a necessity.'

To account for these properties, Kim (2000) and Kim & Sag (2002) regard *not* and *ne-pas* not as heads of their own functional projection, but rather as adverbs that modify nonfinite VPs. The lexical entries for *ne-pas* and *not* include the information shown in (12).⁶

$$(12) \left[\begin{array}{l} \text{FORM} \langle \text{not/ne-pas} \rangle \\ \text{SYN|HEAD} \left[\begin{array}{l} \text{adv} \\ \text{MOD} \langle \text{VP}[\text{nonfin}]: [2] \rangle \end{array} \right] \\ \text{SEM} \left[\text{RESTR} \left\langle \left[\begin{array}{l} \text{PRED} \text{ neg-rel} \\ \text{ARG1} [2] \end{array} \right] \right\rangle \right] \end{array} \right]$$

The lexical information in (12) specifies that *not* and *ne-pas* modify a nonfinite VP and that this modified VP serves as the semantic argument of the negation. This simple lexical specification correctly describes the distributional similarities between English *not* and French *ne-pas*, licensing the structure in Figure 1.

⁶Here we assume that both languages distinguish *fin(ite)* and *nonfin(ite)* verb forms, but that certain differences exist regarding lower levels of organization. For example, *prp* (*present participle*) is a subtype of *fin* in French, whereas it is a subtype of *nonfin* in English.



Figure 1: Structure of constituent negation

This structure implies that both *ne-pas* and *not* need to precede the VPs that they modify.⁷ It also indicates that the negator does not separate an infinitival verb from its complements, as observed from the following data:

- (13) a. [Not [speaking English]] is a disadvantage.
 b. * [Speaking not English] is a disadvantage.
- (14) a. [Ne pas [VP parler français]] est un grand désavantage en ce
 ne not to.speak French is a great disadvantage in this
 cas.
 case
 b. * [Ne parler pas français] est un grand désavantage en ce cas.

Interacting with the LP constraint, the lexical specification in (12) ensures that the constituent negation precede the VP it modifies. This predicts the grammaticality of (13a) and (14a), where *ne-pas* and *not* are used as VP[*nonfin*] modifiers. (13b) and (14b) are ungrammatical, since the modifier fails to appear in the required position – i.e., before all elements of the nonfinite VP.

The HPSG analyses sketched here have thus recognized the fact that finiteness plays a crucial role in determining the distributional possibilities of negative adverbs. Its main explanatory resource has basically come from the proper lexical specification of these negative adverbs. The lexical specification that *pas* and *not* both modify nonfinite VPs has sufficed to predict their occurrences in nonfinite clauses.

⁷This is constrained by the LP (linear precedence) Rule that specifies that a modifier precedes the head that it modifies.

2.3 Sentential negation

With respect to negation in finite clauses, there are important differences between English and French. As we have noted earlier, it is a general fact of French that *pas* must follow a finite verb, in which case the verb optionally bears negative morphology (*ne*-marking):

- (15) a. Dominique (n')aime pas Alex.
b. *Dominique pas aime Alex.

In English, *not* must follow a finite auxiliary verb, not a lexical (or main) verb:

- (16) a. Dominique does not like Alex.
b. *Dominique not does like Alex.
c. *Dominique likes not Alex.

In contrast to the distribution of *not* in nonfinite clauses as constituent negation, its distribution in finite clauses concerns sentential negation. The need to distinguish the two types of negation can be found from scope possibilities in an example like (17) (see Klima 1964; Baker 1989; Warner 2000).⁸

- (17) The president could not approve the bill.

Negation here could have the two different scope readings paraphrased in the following:

- (18) a. It would be possible for the president not to approve the bill.
b. It would not be possible for the president to approve the bill.

The first interpretation is constituent negation; the second is sentential negation. As noted, sentential *not* may not modify a finite VP, different from the adverb *never*:

- (19) a. Lee never/*not left. (cf. Lee did not leave.)
b. Lee will never/not leave.

The contrast in these two sentences shows one clear difference between *never* and *not*. The negator *not* cannot precede a finite VP, though it can freely occur as a nonfinite VP modifier.

Another distributional difference between *never* and *not* is found in the VP ellipsis construction. Observe the following contrast (Kim & Sag 2002):

⁸Warner (2000) and Bender & Lascarides (2013b) discuss scopal interactions of negation with auxiliaries (modals) and quantifiers within the system of Minimal Recursion Semantics (MRS).

- (20) a. Mary sang a song, but Lee never could __.
 b. * Mary sang a song, but Lee could never __.
 c. Mary sang a song, but Lee could not __.

The data here indicate that *not* behaves differently from adverbs like *never* in finite contexts, even though the two behave alike in nonfinite contexts. The adverb *never* is a true diagnostic of a VP-modifier, and we use contrasts between *never* and *not* to reason about what the properties of the negator *not* must be.

We saw the lexical representation for constituent negation *not* in (12) above. Unlike the constituent negator, the sentential negator *not* typically follows a finite auxiliary verb. In this respect, *too*, *so*, and *indeed* also behave alike:

- (21) a. Kim will not read it.
 b. Kim will too/so/indeed read it.

These expressions are used to reaffirm the truth of the sentence in question and follow a finite auxiliary verb. This implies that the sentential *not* in English form a group of adverbs that combine with a preceding auxiliary verb (see Kim 2000).

With the observation of such properties, the HPSG analyses of Abeillé & Godard (1997), Kim (2000), and Warner (2000) have taken this group of adverbs (Adv_I) including the sentential negation *not* to function as the complement of a finite auxiliary verb via the following lexical rule:⁹

- (22) NEGATIVE ADVERB-COMPLEMENT LEXICAL RULE:

$$\left[\begin{array}{c} \text{fin-aux} \\ \text{SYN} \left[\begin{array}{c} \text{HEAD} \left[\begin{array}{c} \text{AUX} + \\ \text{VFORM} \text{ fin} \end{array} \right] \\ \text{VAL|COMPS } L \end{array} \right] \end{array} \right] \mapsto \left[\begin{array}{c} \text{neg-fin-aux} \\ \text{SYN} \left[\begin{array}{c} \text{HEAD} \left[\begin{array}{c} \text{AUX} + \\ \text{VFORM} \text{ fin} \\ \text{NEG} + \end{array} \right] \\ \text{VAL|COMPS } \langle \text{Adv}_I \rangle \oplus L \end{array} \right] \end{array} \right]$$

This lexical rule specifies that when the input is a finite auxiliary verb, the output is a neg-finite auxiliary ($\text{fin-aux} \rightarrow \text{neg-fin-aux}$) that selects Adv_I as an additional complement. This would then license a structure like in Figure 2.

As shown in Figure 2, the negative finite auxiliary verb *could* selects two complements, the negator *not* and the VP *approve the bill*. The finite auxiliary then combines with these two complements, creating a well-formed head-complement construct. By treating *not* as both a modifier (constituent negation) and a lexical complement (sentential negation), we thus can account for the scope differences in (17) with the following two possible structures:

⁹The symbol \oplus stands for the function *append*, i.e., a relation that concatenates two lists.



Figure 2: Structure of sentential negation

- (23) a. The president could [not [approve the bill]].
 b. The president [could] [not] [approve the bill].

In (23a), *not* functions as a modifier to the base VP, while in (23b), whose partial structure is given in Figure 2, it is a sentential negation that functions as the complement of the finite auxiliary with a wide scope reading.

The present analysis can also offer us a simple way to account for various other phenomena, including the VP ellipsis discussed in (20). The point was that unlike *never*, the sentential negation can host a VP ellipsis. The VP ellipsis after *not* is possible, given that any VP complement of an auxiliary verb can be unexpressed, as specified by the following lexical rule (**kim:00**):

- (24) PREDICATE ELLIPSIS LEXICAL RULE:
- $$\left[\begin{array}{l} \text{aux-v-lxm} \\ \text{ARG-ST } \langle [1]\text{XP}, [2]\text{YP} \rangle \end{array} \right] \mapsto \left[\begin{array}{l} \text{aux-ellipsis-wd} \\ \text{COMPS } \langle \rangle \\ \text{ARG-ST } \langle [1]\text{XP}, [2]\text{YP}[pro] \rangle \end{array} \right]$$

What the rule in (24) tells us is that an auxiliary verb selecting two arguments can be projected into an elided auxiliary verb whose second argument is realized as a small *pro*. Note that this argument is not mapped onto the syntactic grammatical function COMPS. This would then license the structure in Figure 3:

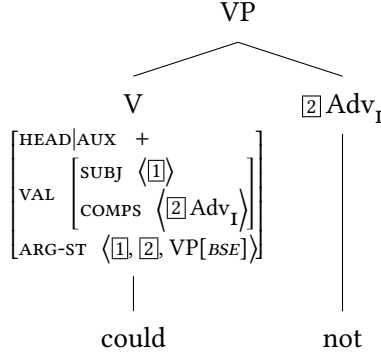


Figure 3: A licensed VP ellipsis structure

As represented in Figure 3, the auxiliary verb *could* forms a well-formed head-complement construct with *not* while its VP[bse] is unrealized (see Kim 2000; Kim & Sells 2008 for detail). The sentential negator *not* can “survive” VP ellipsis because it can be licensed in the syntax as the complement of an auxiliary, independent of the following VP. However, an adverb like *never* is only licensed as a modifier of VP. Thus if the VP were elided, we would have the hypothetical structure like the one in Figure 4: the adverb *never* modifies a VP through the feature

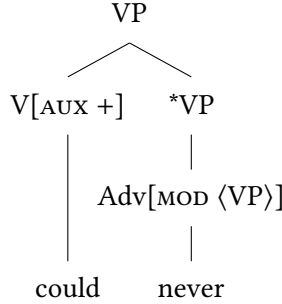


Figure 4: Ill-formed structure of the head-mod construction

MOD, which guarantees that the adverb requires the head VP that it modifies. In an ellipsis structure, the absence of such a VP means that there is no VP for the adverb to modify. In other words, there is no rule licensing such a combination – predicting the ungrammaticality of **has never*, as opposed to *has not*.

The HPSG analysis just sketched here can be easily extended to French negation, whose data we repeat here.

- (25) a. * Robin ne pas aime Stacy.
 Robin ne NEG likes Stacy
 ‘Robin does not like Stacy.’
 b. Robin (n’)aime pas Stacy.
 Robin (n’)likes NEG Stacy
 ‘Robin does not like Stacy.’

Unlike the English negator *not*, *pas* must follow the finite verb. Such a distributional contrast has motivated verb movement analyses (see Pollock 1989; Zanuttini 2001). By contrast, the present HPSG analysis is cast in terms of a lexical rule that maps a finite verb into a verb with a certain adverb like *pas* as an additional complement. The idea of converting modifiers in French into complements has been independently proposed by Miller (1992) and Abeillé & Godard (1994) for French adverbs including *pas*. Building upon this previous work, Abeillé & Godard (1997) and Kim (2000) allow the adverb *pas* to function as a syntactic complement of a finite verb in French.¹⁰ This output verb *neg-fin-v* then allows the negator *pas* to function as the complement of the verb *n’aime*, as represented in Figure 5.

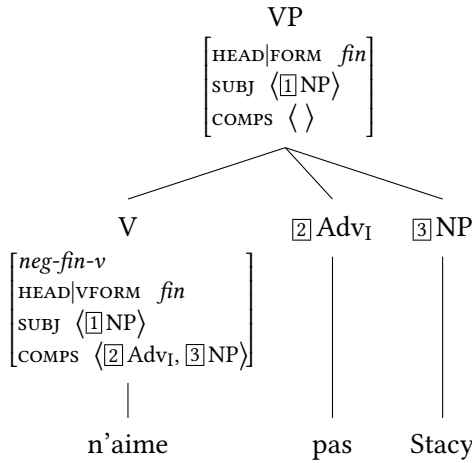


Figure 5: Partial structure of (25b)

The analysis also explains the position of *pas* in finite clauses. The placement of *pas* before a finite verb in (25a) is unacceptable, since *pas* here is used not as a

¹⁰Following Abeillé & Godard (1994), we could assume *ne* to be an inflectional affix which can be optionally realized in the output of the lexical rule in Modern French.

nonfinite VP modifier, but as a finite VP modifier. But due to the present analysis which allows *pas*-type negative adverbs to function as the complement of a finite verb, *pas* in (25b) can function as the sister of the finite verb *aime*.

Given that the conditional, imperative, subjunctive, and even present participle verb forms in French are finite, the construction analysis also predicts that *pas* cannot precede any of these verb forms:

- (26) a. Si j'avais de l'argent, je n'achèterais pas.
'If I had money, I would not buy a car.'
- b. * Si j'avais de l'argent, je ne pas achèterais.
- (27) a. Ne mange pas ta soupe.
'Don't eat your soup!'
- b. * Ne pas mange ta soupe.
- (28) a. Il est important que vous ne répondiez pas.
'It is important that you not answer.'
- b. * Il est important que vous ne pas répondiez.
- (29) a. Ne parlant pas Français, Stacy avait des difficultés.
'Not speaking French, Stacy had difficulties.'
- b. * Ne pas parlant Français, Stacy avait des difficultés.

Note that this analysis allows us to reduce the differences between French and English negation to a matter of lexical properties. The negators *not* and *pas* are identical in that they both are VP[*nonfin*]-modifying adverbs. But they are different with respect to which verbs can select them as complements: *not* can be the complement of a finite auxiliary verb, whereas *pas* can be the complement of any finite verb. So the only difference is the morphosyntactic value [AUX +], and this induces the difference in positioning the negators in English and French.

3 Morphological negative

As noted earlier, languages like Turkish and Japanese employ morphological negation in which the negative marker behaves like a suffix. Consider the Turkish and Japanese examples in the following:

- (30) a. Git-me-yeceğ-Ø-im
go-NEG-FUT-COP-1SG
'(I) will not come.'

- b. kare-wa kinoo kuruma-de ko-na-katta.
he-TOP yesterday car-INST come-NEG-PST
'He did not come by car yesterday.'

As the examples illustrate, the sentential negation of Turkish and Japanese employ morphological suffixes *-me* and *-na*, respectively. It is possible to state the ordering of these morphological negative markers in configurational terms by assigning an independent syntactic status to them. But it is too strong a claim to take the negative suffix *-me* or *-na* to be an independent syntactic element, and to attribute its positional possibilities to syntactic constraints such as verb movement and other configurational notions (see Kelepir 2001 for Turkish and Kato 1997; 2000 for Japanese). In these languages, the negative affix acts just like other verbal inflections in numerous respects. The morphological status of these negative markers comes from their morphophonemic alternation. For example, the vowel of the Turkish negative suffix *-me* shifts from open to closed when followed by the future suffix, as in *gel-mi-yecke* 'come-NEG-FUT'. Their strictly fixed position also indicates their morphological constituenthood. Though these languages allow a rather free permutation of syntactic elements (scrambling), there exist strict ordering restrictions among verbal suffixes including the negative suffix, as can be seen from the following examples:

- (31) a. tabe-sase-na-i/*tabe-na-sase-i
eat-CAUS-NEG-NPST
b. tabe-rare-na-katta/*tabe-na-rare-katta
eat-PASS-NEG-PST
c. tabe-sase-rare-na-katta/*tabe-sase-na-rare-katta
eat-CAUS-PASS-NEG-PST

The ordering of the negative affix is a matter of morphology. If it were a syntactic concern, then the question would arise as to why there is an obvious contrast in the ordering principles of morphological and syntactic constituents, i.e., why the ordering rules of morphology are distinct from the ordering rules of syntax. The simplest explanation for this contrast is to accept the view that morphological constituents including the negative marker are formed in the lexical component and hence have no syntactic status (see Kim 2000 for detailed discussion).

This being noted, it is more reasonable to assume that the placement of a negative affix is regulated by morphological principles, i.e., by the properties of the morphological negative affix itself. Przepiórkowski & Kupść (1999) and Przepiór-

kowski (2000; 2001) discuss aspects of Polish negation which is realized as the prefix *nie* to a verbal expression.

The process of adding a negative morpheme to a lexeme can be modeled straightforwardly by a lexical rule given in the following (see Kim 2000; Crowgey 2012):

(32) NEGATIVE WORD FORMATION LEXICAL RULE:

$$\left[\begin{array}{l} v\text{-}lxm \\ \text{FORM } \langle \textcircled{1} \rangle \\ \text{SEM } \textcircled{2} \end{array} \right] \mapsto \left[\begin{array}{l} neg\text{-}v\text{-}lxm \\ \text{FORM } \langle F_{neg}(\textcircled{1}) \rangle \\ \text{SYN|HEAD|POL } neg \\ \text{SEM } \left[\text{RESTR } \left(\left[\text{PRED } neg\text{-}rel \right] \right) \right] \end{array} \right]$$

As shown here, any verb lexeme can be turned into a verb with the negative morpheme attached. That is, the language-particular definition for F_{neg} will ensure that an appropriate negative morpheme is attached to the lexeme. For instance, the suffix *-ma* for Turkish and *-na* for Japanese will be attached to the verb lexeme, generating the verb forms in (30a).

This morphological analysis can be extended to the negation of languages like Libyan Arabic, as discussed in Borsley & Krer (2012). The language has a bipartite realization of negation, the proclitic *ma-* and the enclitic *-š*:

- (33) *la-wlaad ma-mšuu-š* *li-l-madrsa.*
the-boys NEG-go.PST.3.PL-NEG to-the-school
‘The boys didn’t go to the school.’

As Borsley & Krer (2012) did, we could take these clitics as affixes and generate a negative word as follows:¹¹

$$(34) \left[\begin{array}{l} \text{FORM } \langle m\check{s}uu \rangle \\ \text{SEM } \textcircled{2} \end{array} \right] \mapsto \left[\begin{array}{l} \text{FORM } \langle ma\text{-}m\check{s}uu\text{-}\check{s} \rangle \\ \text{SYN|HEAD|POL } neg \\ \text{SEM } \left[\text{RESTR } \left(\left[\text{PRED } neg\text{-}rel \right] \right) \right] \end{array} \right]$$

The only thing we need to define here is the function F_{neg} in the language that allows the attachment of the prefix *ma-* and the suffix *-š* to the verb stem *mšuu*.¹²

¹¹The formulation given in Borsley & Krer (2012) is slightly different from the one given here, but both have the same effects.

¹²Borsley & Krer (2012) note that the suffix *-š* is not realized when a negative clause includes an n-word or an NPI (negative polarity item). See Borsley & Krer (2012) for further details.

The lexicalist HPSG analyses sketched here have been built upon the thesis that autonomous (i.e., non-syntactic) principles govern the distribution of morphological elements (Bresnan & Mchombo 1991). The position of the morphological negation is simply defined in relation to the verb stem it attaches to. There are no syntactic operations such as head-movement or multiple functional projections in forming a verb with the negative marker.¹³

4 Negative auxiliary verb

Another way of expressing sentential negation, as noted earlier, is to employ a negative auxiliary verb. Some head-final languages like Korean and Hindi employ negative auxiliary verbs. Consider a Korean example:

- (35) John-un ku chayk-ul ilk-ci anh-ass-ta.
John-TOP that book-ACC read-CONN NEG-PST-DECL
'John did not read the book.'

The negative auxiliary in head-final languages like Korean typically appears clause-finally, following the invariant form of the lexical verb. In head-initial SVO languages, however, the negative auxiliary almost invariably occurs immediately before the lexical verb (Payne 1985). Finnish also exhibits this property (Mitchell 1991):

- (36) Minä e-n puhu-isi.
I.NOM NEG-1SG speak-COND
'I would not speak.'

These negative auxiliaries have syntactic status: they can be inflected, above all. Like other verbs, they can be marked with verbal inflections such as agreement, tense, and mood.

In dealing with auxiliary negative constructions, most of the derivational approaches have followed Pollock's and Chomsky's analyses in factoring out grammatical information (such as tense, agreement, and mood) carried by lexical items into various different phrase-structure nodes (see, among others, Hagstrom 2002, Han et al. 2007 for Korean, and Vasisht 2000 for Hindi). This derivational view

¹³The lexical-rule-based approach here can be extended to a construction-based HPSG approach or a constructionist approach. See Sag (2012) and Hilpert (2016) for a construction-based approach to morphological processes.

has been appealing in that the configurational structure for English-type languages could be applied even for languages with different types of negation. However, issues arise about how to address the grammatical properties of auxiliary negatives, which are quite different from the other negative forms.

The Korean negative auxiliary displays all the key properties of auxiliary verbs in the language. For instance, the typical auxiliary verbs as well as the negative auxiliary all require the preceding lexical verb to be marked with a specific verb form (VFORM), as illustrated in the following:

- (37) a. *ilk-ko/*-ci* *siph-ta*.
 read-CONN/CONN would.like-DECL
 ‘(I) would like to read.’
 b. *ilk-ci* *anh-ass-ta*.
 read-CONN NEG-PST-DECL
 ‘(I) did not read.’

The auxiliary verb *siph-* in (37a) requires the *-ko*-marked lexical verb while the negative auxiliary verb *anh-* in (37b) asks for the *-ci*-marked lexical verb.

In terms of syntactic structure, there are two possible analyses. One is to assume that the negative auxiliary takes a VP complement and the other is to claim that it forms a verb complex with the preceding lexical verb, as represented in Figures 6a and 6b, respectively (Chung 1998a; Kim 2016).

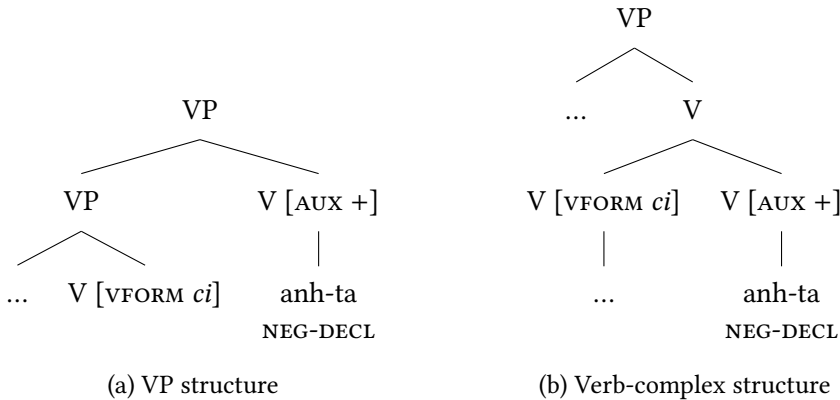


Figure 6: Two possible structures with the negative auxiliary

The distributional properties of the negative auxiliary in the language, however, support a complex predicate structure (cf. Figure 6b) in which the negative

auxiliary verb forms a syntactic/semantic unit with the preceding lexical verb. For instance, no adverbial expression, including a parenthetical adverb, can intervene between the main and auxiliary verb, as illustrated by the following Korean example:

- (38) Mimi-nun (yehathun) tosi-lul (yehathun) ttena-ci (*yehathun)
 Mimi-TOP anyway city-ACC anyway leave-CONN anyway
 anh-ass-ta.
 NEG-PST-DECL
 ‘Anyway, Mimi didn’t leave the city.’

Further, in an elliptical construction, the elements of a verb complex always occur together. Neither the lexical verb nor the auxiliary verb alone can serve as the fragment answer to the polar question. The two verbs must occur together.

- (39) a. Kim-i hakkyo-eyse pelsse tolawa-ss-ni?
 Kim-NOM school-SRC already return-PST-QUE
 ‘Did Kim return from school already?’
 b. ka-ci-to anh-ass-e.
 go-CONN-DEL NOT-PST-DECL
 ‘(He) didn’t even go.’
 c. *ka-ci-to.
 go-CONN-DEL
 d. *anh-ass-e.
 NEG-PST-DECL

As shown in (39c) and (39d) here, neither the lexical verb nor the auxiliary verb alone can serve as an independent fragment answer. The two verbs must appear together as given in (39b). These constituent tests indicate that the negative auxiliary forms a syntactic unit with a preceding lexical verb in Korean. Following the HPSG analyses of Bratt (1996), Chung (1998b), and Kim (2016), we could assume that an auxiliary verb forms a complex predicate, licensed by the following construction:

- (40) HEAD-LIGHT CONSTRUCTION:

$$\left[\begin{array}{l} hd-light-cxt \\ COMPS\ L \\ LIGHT + \end{array} \right] \rightarrow \boxed{1} \left[\begin{array}{l} LIGHT + \\ COMPS\ L \end{array} \right], H \left[\begin{array}{l} LIGHT + \\ COMPS\ \langle \boxed{1} \rangle \oplus L \end{array} \right]$$

This construction rule means that a LIGHT head expression combines with a LIGHT complement, yielding a light, quasi-lexical constituent (Bonami & Webelhuth

2013). When this combination happens, there is a kind of argument composition: the COMPS value (L) of this lexical complement is passed up to the resulting mother. The constructional constraint thus induces the effect of argument composition in syntax, as illustrated by the following example:

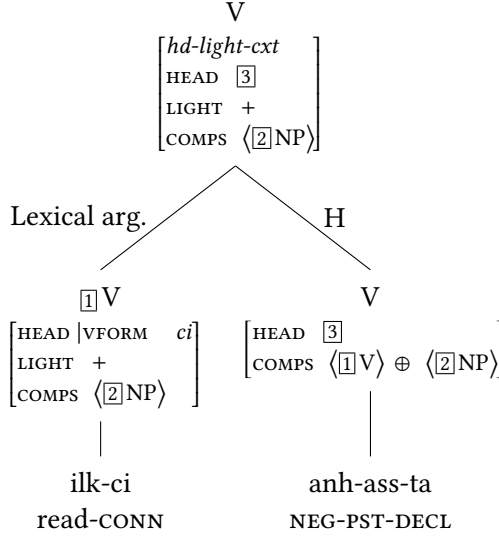


Figure 7: An instance (construct) of the HEAD-LIGHT CONSTRUCTION

The auxiliary verb *anh-ass-ta* ‘NEG-PST-DECL’ combines with the matrix verb *ilk-ci* ‘read-CONN’, creating a well-formed head-light construct. Note that the resulting construction metaphorically inherits the COMPS value from that of the lexical complement *ilk-ci* ‘read-CONN’ in accordance with the structure-sharing imposed on by the HEAD-LIGHT CONSTRUCTION in (40). That is, the HEAD-LIGHT CONSTRUCTION licenses the combination of an auxiliary verb with its lexical verb, while inheriting the lexical verb’s complement value as argument composition. The present system thus allows the argument composition at the syntax level, rather than in the lexicon.

The HPSG analyses have taken the negative auxiliary in Korean to select a lexical verb, whose combination forms a verb complex structure. The present analysis implies that there is no upper limit for the number of auxiliary verbs to occur in sequence, as long as each combination observes the morphosyntactic constraint on the preceding auxiliary expression. Consider the following:

- (41) a. sakwa-lul [mek-ci anh-ta].
apple-ACC eat-CONN NEG-DECL
'do not eat the apple'
- b. sakwa-lul [[mek-ko siph-ci] anh-ta].
apple-ACC eat-CONN wish-CONN NEG-DECL
'would not like to eat the apple'
- c. sakwa-lul [[[mek-ko siph-e] ha-ci] anh-ta].
apple-ACC eat-CONN wish-CONN do-CONN NEG-DECL
'do not like to eat the apple'
- d. sakwa-lul [[[[mek-ko siph-e] ha-key] toy-ci] anh-ta].
apple-ACC eat-CONN wish-CONN do-CONN become-CONN NEG-DECL
'do not become to like to eat the apple.'

As seen from the bracketed structures, we can add one more auxiliary verb to an existing head-light construct with the final auxiliary bearing an appropriate connective marker. There is no upper limit to the possible number of auxiliary verbs we can add (see Kim 2016 for detailed discussion).

The present analysis in which the auxiliary negative forms a complex predicate structure with a lexical verb can be applied for languages like Basque, as suggested by Crowgey & Bender (2011). They explore the interplay of sentential negation and word order in Basque. Consider their example:

- (42) ez-ditu irakurri liburuak.
NEG-3PLO.PRES.3SGS read.PERF book.ABS.PL
'has not read books'

Unlike Korean, the negative auxiliary *ez-ditu* precedes the main verb. Other than this ordering difference, just like Korean, the two form a verb complex structure, as represented in Figure 8 (adopted from Crowgey & Bender 2011):

In the treatment of negative auxiliary verbs, the HPSG analyses have taken the negative auxiliary to be an independent lexical verb whose grammatical (syntactic) information is not distributed over different phrase structure nodes, but rather is incorporated into its precise lexical specifications. In particular, the negative auxiliary forms in many languages a verb complex structure, whose constituenthood is motivated by other independent phenomena.



Figure 8: Partial structure of (42)

5 Preverbal negative

The final type of sentence negation is preverbal negatives, which we can observe in languages like Italian and Welsh:

- (43) a. Gianni non telefona a nessuno. (Italian)
Gianni NEG telephones to no.one
'Gianni does not call anyone.'
- b. Dw i ddim wedi gweld neb. (Welsh)
am I NEG PERF see nobody
'I haven't seen anybody.'

As seen here, in Italian, the preverbal negative *non*, also called negative particle or clitic, always precedes a lexical verb, whether finite or non-finite, as further attested by the following examples:

- (44) a. Gianni vuole che io non legga articoli di sintassi.
Gianni wants that I NEG read articles of syntax.
'Gianni hopes that I do not read syntax articles.'
- b. Non leggere articoli di sintassi è un vero peccato.
NEG to.read articles of syntax is a real shame
'Not to read syntax articles is a real shame.'

- c. Non leggendo articoli di sintassi, Gianni trova la linguistica noiosa.
 NEG reading articles of syntax Gianni finds linguistics boring
 ‘Not reading syntax articles, Gianni finds linguistics boring.’

The derivational view again attributes the distribution of such a preverbal negative to the reflex of verb movement and functional projections (see Belletti 1990; Zanuttini 1991). This line of analysis also appears to be persuasive in that the different scope of verb movement application could explain the observed variations among typologically and genetically related languages. Such an analysis, however, fails to capture unique properties of preverbal negative in contrast to the morphological negative, the auxiliary negative, and the adverb negative.

Kim (2000) offers an HPSG analysis of Italian and Spanish negation. His analysis takes *non* to be an independent lexical head element, even though it is a clitic. This claim follows the analyses sketched by Monachesi (1993) and Monachesi (1998) assuming that there are two types of clitics, affix-like clitics and word-like clitics: pronominal clitics belong to the former, whereas the bisyllabic clitic *loro* ‘to-them’ to the latter. Kim’s analysis suggests that *non* also belongs to the latter group.¹⁴ One key difference from pronominal clitics is thus that *non* functions as an independent word. Treating *non* as a word-like element will allow us to capture its word-like properties such as the possibility of stress on the negator and its separation from the first verbal element. However, it is not a phrasal modifier, but an independent particle (or clitic) which combines with the following lexical verb.¹⁵

(45) Lexical specifications for *non* in Italian:

$$\left[\begin{array}{l} \text{FORM } \langle \text{non} \rangle \\ \text{SYN } \left[\begin{array}{l} \text{HEAD } \boxed{1} \\ \text{COMPS } \left\langle \text{V} \left[\begin{array}{l} \text{HEAD } \boxed{1} \\ \text{COMPS } L \end{array} \right] \right\rangle \oplus L \end{array} \right] \\ \text{SEM } \left[\text{RESTR } \left\langle \left[\text{PRED } \text{neg-rel} \right] \right\rangle \right] \end{array} \right]$$

This lexical entry roughly corresponds to the entry for Italian auxiliary verbs (and restructuring verbs with clitic climbing), in that the negator *non* selects a verbal complement and, further, the complement list (L). One key property of *non* is its HEAD value: this value is in a sense undetermined, but structure-shared

¹⁴But one main difference between *non* and *loro* is that *non* is a head element, whereas *loro* is a complement XP. See Monachesi (1998) for further discussion of the behavior of *loro* and its treatment.

¹⁵See Kim (2000) for detailed discussion.

with the HEAD value of its verbal complement. The value is thus determined by what it combines with. When *non* combines with a finite verb, it will be a finite verb. When it combines with an infinitive verb, it will be an infinitive verb.

In order to see how this system works, let us consider an Italian example where the negator combines with a transitive verb as in the following:

- (46) Gianni non legge articoli di sintassi.
 Gianni NEG reads articles of syntax
 ‘Gianni doesn’t read syntax articles.’

When the negator *non* combines with the finite verb *legge* that selects an NP object, the resulting combination will form a verb complex structure given in Figure 9.

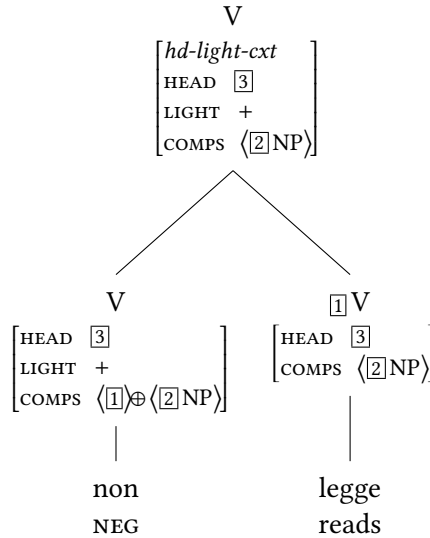


Figure 9: Verb complex structure of (46)

Borsley (2006), adopting Kathol’s (2000) topological approach, provides a linearization-based HPSG approach to capturing the distributional possibilities of negation in Italian and Welsh, which we have seen in (43a) and in (43b), respectively. Different from Borsley & Jones’s (2005) selectional approach where a negative expression selects its own complement, his linearization-based approach assigns the negative expression in each language to a specified topological field with the assumption that constituents have an order domain to which ordering

constituents apply. Borsley (2006), accepting the analysis of Kim (2000) where *non* is taken to be a type of clitic-auxiliary, posits the following order domain:

$$(47) \left[\text{DOM} \left[\left[\begin{array}{c} \text{first} \\ \langle \text{Gianni} \rangle \end{array} \right], \left[\begin{array}{c} \text{second} \\ \text{NEG} + \\ \langle \text{non} \rangle \end{array} \right], \left[\begin{array}{c} \text{third} \\ \langle \text{telephona} \rangle \end{array} \right], \left[\begin{array}{c} \text{third} \\ \text{NEG} + \\ \langle \text{a nessuno} \rangle \end{array} \right] \right] \right]$$

With this ordering domain, Borsley (2006) postulates that the Italian sentential negator *non* bearing the positive NEG feature is in the second field.¹⁶ The analysis then can attribute the distributional differences between Italian and Welsh negators by referring to the difference in their domain value. That is, within the analysis, the Welsh NEG expression *ddim*, unlike Italian *non*, is defined to be in the third field as illustrated in the following domain for the sentence (43b) (from Borsley 2006):¹⁷

$$(48) \left[\text{DOM} \left[\left[\begin{array}{c} \text{second} \\ \langle \text{dw} \rangle \end{array} \right], \left[\begin{array}{c} \text{third} \\ \langle \text{i} \rangle \end{array} \right], \left[\begin{array}{c} \text{third} \\ \text{NEG} + \\ \langle \text{ddim} \rangle \end{array} \right], \left[\begin{array}{c} \text{third} \\ \langle \text{wedi gweld neb} \rangle \end{array} \right] \right] \right]$$

6 Other related phenomena

In addition to this work focusing on the distributional possibilities of negation, there has also been work on genitive negation and negative concord.

Przepiórkowski (2000) focuses on the non-local genitive of negation in Polish where the object argument is not accusative but genitive-marked with the presence of negative marker as in (49a). The assignment of genitive case to the object is also effective in the unbounded relation as shown in (50a) (data from Przepiórkowski 2000):

- (49) a. *Lubię Marię*
 like-1st.SG Mary-ACC
 ‘I like Mary.’
 b. *Nie lubię Marii/*Marię*
 not like-1st.SG Mary-GEN/Mary-ACC
 ‘I don’t like Mary.’

¹⁶Borsley (2006) also notes that Italian negative expressions like *nessuno* ‘nobody’ also bear the feature NEG but are defined to be in the third field.

¹⁷Different from Borsley (2006), Borsley & Jones (2000) offer a selectional analysis of Welsh negation. That is, the finite negative verb selects two complements (e.g., subject and object) while the nonfinite negative verb selects a VP. See Borsley & Jones (2000) for details.

- (50) a. Janek wydawał się lubić Marię.
 John seemed RM like-INF Mary-ACC
 ‘John seemed to like Mary.’
 Janek nie wydawał się lubić Marii/Marię.
 John not seemed RM like-INF Mary-GEN/Mary-ACC
 ‘John did not seem to like Mary.’

To account for this kind of phenomenon, Przepiórkowski (2000) develops an HPSG-based analysis with the assumption that the combination of the negative morpheme *nie* with the verb stem introduces the feature NEG.¹⁸ The case assignment constraint such that a NEG verbal expression assigns the GEN to its non-initial argument ensures that the object NP in (49ab) is GEN-marked (adopted from Przepiórkowski 2000):

- (51) POLISH CASE ASSIGNMENT RULE:
- $$\left[\begin{array}{l} \text{HEAD} \left[\begin{array}{l} \text{verb} \\ \text{NEG} + \end{array} \right] \\ \text{ARG-ST} \langle \text{XP}, \text{YP}[\text{CASE str}] \rangle \end{array} \right] \mapsto \left[\text{ARG-ST} \langle \text{XP} \rangle \oplus \langle \text{NP}[\text{CASE gen}] \rangle \oplus L \right]$$

This type constraint will ensure that the object complement of (49a) is GEN-marked due to the negative word *nie*. As for the long distance GEN in (50a), Przepiórkowski (2000) allows the VP complement of raising verbs like *seem* to optionally undergo the lexical argument composition, yielding the following for the matrix verb in (50a):

- (52)
$$\left[\begin{array}{l} \text{FORM} \langle \text{nie wydawał się} \rangle \\ \text{HEAD} \left[\begin{array}{l} \text{verb} \\ \text{NEG} + \end{array} \right] \\ \text{ARG-ST} \langle \text{NP}, \text{VP}[\text{COMPS} \langle \text{[NP]} \rangle] \rangle \oplus \langle \text{[NP]}[\text{str}] \rangle \end{array} \right]$$

This lexical specification allows the object NP of the verb to get GEN-marked in accordance with the constraint in (51).¹⁹ In Przepiórkowski’s analysis, the feature NEG thus tightly interacts with the mechanism of argument composition and construction-based case assignment (or satisfaction).

Negative concord also concerns negation that we often find in languages like French, Italian, Polish, and so forth. De Swart & Sag (2002) investigates negative concord in French, where multiple occurrences of phonologically negative constituents express either double negation or single negation:

¹⁸In Polish, negation is realized as the prefix *nie* to a verbal expression (see Przepiórkowski & Kupść 1999; Przepiórkowski 2000; 2001).

¹⁹When there is no argument composition, the positive verb *lubić* assigns ACC to the object NP.

- (53) *Personne n'aime personne.*
 No.one (n')likes no.one
 'No one is such that they love no one.' (double negation)
 'No one likes anyone.' (negative concord)

The double negation reading in (53) has two quantifiers while the single negation reading is an instance of negative concord, where the two quantifiers merge into one. De Swart & Sag (2002) assume that the information of each quantifier is stored in *QSTORE* and retrieved at the lexical level in accordance with constraints on the verb's arguments and semantic content. For instance, the verb *n'aime* in (53) will have two different ways of retrieving the *QSTORE* value as in the following:²⁰

- (54) a.
$$\left[\begin{array}{l} \text{FORM } \langle n'aime \rangle \\ \text{ARG-ST } \langle \text{NP}[\text{STORE } \{[1]\}], \text{NP}[\text{STORE } \{[2]\}] \rangle \\ \text{QUANTS } \langle [1], [2] \rangle \end{array} \right]$$

 b.
$$\left[\begin{array}{l} \text{FORM } \langle n'aime \rangle \\ \text{ARG-ST } \langle \text{NP}[\text{STORE } \{[1]\}], \text{NP}[\text{STORE } \{[2]\}] \rangle \\ \text{QUANTS } \langle [1] \rangle \end{array} \right]$$

In (54a), the two quantifiers are retrieved, inducing double negation ($\neg\exists x\neg\exists y[\text{Love}(x,y)]$) while in (54b), the two have a resumptive interpretation in which the two are merged into one ($\neg\exists x\exists y[\text{Love}(x,y)]$).²¹ This analysis, coupled with the complement treatment of *pas* as a lexically stored quantifier, can account for why *pas* does not induce a resumptive interpretation with a quantifier (from De Swart & Sag 2002):

- (55) *Il ne va pas nulle part, il va à son travail.*
 'He does not go nowhere, he goes to work.'

In this standard French example, De Swart & Sag (2002), accepting the analysis of Kim (2000) as *pas* as a complement, specify the adverbial complement *pas* to be included the negative quantifier in the *QUANTS* value. This means there would be no resumptive reading for standard French, inducing double negation as in (56):²²

²⁰The *QSTORE* value contains information roughly equivalent to first order logic expressions like $\text{NOx}[\text{Person}(x)]$. See De Swart & Sag (2002).

²¹See De Swart & Sag (2002) for detailed formulation of the retrieval condition of stored value.

²²See De Swart & Sag (2002) for cases where *pas* induces negative concord.

$$(56) \left[\begin{array}{l} \text{FORM } \langle ne \text{ } va \rangle \\ \text{ARG-ST } \langle \text{ADV}_I[\text{STORE } \{1\}], \text{NP}[\text{STORE } \{2\}] \rangle \\ \text{QUANTS } \langle [1], [2] \rangle \end{array} \right]$$

Przepiórkowski & Kupść (1999) and Borsley & Jones (2000) also investigate negative concord in Polish and Welsh and offer HPSG analyses. Consider a Welsh example from Borsley & Jones (2000):

- (57) Nid oes neb yn yr ystafell
 NOT is no.one in the room
 ‘There is no one in the room.’

Borsley & Jones (2000), identifying n-words with the feature NC (negative concord), takes the verb *nid oes* to bear the positive NEG value, and specifies the subject *neb yn* to carry the positive NC (negative concord) feature. This selectional approach, interacting with well-defined features, tries to capture how more than one negative element corresponds to a single semantic negation.²³

7 Conclusion

One of the most attractive consequences of the derivational perspective has been that one uniform category, given other syntactic operations and constraints, explains the derivational properties of all types of negation in natural languages, and can further provide a surprisingly close and parallel structure among languages, whether typologically related or not. However, this line of thinking, first of all, runs the risk of missing the peculiar properties of each type of negation. Each individual language has its own way of expressing negation, and moreover has its own restrictions in the surface realizations of negation which can hardly be reduced to one uniform category.

In the nonderivational HPSG analyses for the four main types of sentential negation that I have reviewed in this chapter, there is no uniform syntactic element, though a certain universal aspect of negation does exist, viz. its semantic contribution. Languages appear to employ various possible ways of negating a clause or sentence. Negation can be realized as different morphological and syntactic categories. By admitting morphological and syntactic categories, we have been able to capture their idiosyncratic properties in a simple and natural manner. Furthermore, this theory has been built upon the lexical integrity principle,

²³See Borsley & Jones (2000) for detailed discussion.

the thesis that the principles that govern the composition of morphological constituents are fundamentally different from the principles that govern sentence structures. The obvious advantage of this perspective is that it can capture the distinct properties of morphological and syntactic negation, and also of their distribution, in a much more complete and satisfactory way.

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