Negative Inversion Constructions in HPSG[*]

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Summary. In this paper we will look at the negative inversion (NI) constructions. The major analyses in the Minimalist/Principles-and-Parameters theory claim that the initial negative expression occupies [Spec,FocP]. In this paper, I will argue that there is a body of data which are problematic for the Minimalist/Principles-and-Parameters analysis but that HPSG can provide a fairly straightforward account of the facts. The use of hierarchically organised network of clausal types allows us to accommodate not just the construction-specific properties of NI sentences but also the regularities that they share with other constructions with subject-auxiliary inversion.

Keywords: negative inversion constructions, left periphery, clause structure

1   Introduction

In this paper we will look at the negative inversion (NI) constructions. The sentences in (1) are typical examples.

(1)   a.   No race could Lewis win.
       b.   Under no circumstances will he eat raw spaghetti.

The major analyses in the Minimalist/Principles-and-Parameters theory claim that the initial negative expression occupies [Spec,FocP] (Culicover, 1991; Haegeman, 2000a,b; Rizzi, 1997; etc). The following analysis is Rizzi's (1997).

(2)   [$_{FocP}$ Not a single paper$_i$ [$_{Foc}$ did$_j$ [$_{IP}$ he t$_j$ finish t$_i$ on time]]]

This analysis contains the following two claims. One is that NI sentences have the same structure as *wh*-questions. Rizzi's (1997) analysis of a *wh*-question is the following, in which the initial *wh*-expression occupies [Spec,FocP], as does the initial negative expression in NI in (2).

(3)   [$_{FocP}$ which book$_i$ [$_{Foc}$ will$_j$ [$_{IP}$ you t$_j$ read t$_i$]]]

Another claim is that the initial negative expression is in the same position as preposed focus constituents: many proponents of this approach assume that focus movement, exemplified by the sentences in (4), is an operation which moves a focused element to [Spec,FocP].

(4) a.   LAST year we were living in St. Louis.
    b.   ROBIN I really dislike.   (Culicover, 1991: 34)

In this paper, I will argue that there is a body of data which are problematic for the Minimalist/Principles-and-Parameters analysis but that HPSG can provide a fairly straightforward account of the facts.

2   The data

A variety of data illustrates the contrasting behaviour of *wh*-expressions and negative expressions. First, *wh-* and negative expressions can co-occur in main clauses, as long as the former precedes the latter (Maekawa, 2006: 230).

(5) a.   What under no circumstances would John do for Mary?
    b.   Where under no circumstances would John go for a holiday?

The assumption that they are in a single position [Spec,FocP] leads to the prediction that they should not co-occur (Haegeman, 2000a: 134; Haegeman, 2000b: 46). This is not borne out, however, as the examples cited above illustrate.[1]

Second, there is individual variation about the possibility of unbounded extraction of a negative phrase. Some examples of extracted negative phrases cited in the literature are given below.

(6) a.   Nothing did the doctor say the baby must eat.   (Cormack and Smith, 2000: 401)
    b.   No such chemicals did he know that there were in the bottle.   (Postal, 1998)

For example, the initial negative phrase *nothing* in (6)a is a complement of the verb *eat*, which belongs to the embedded clause. For some speakers, however, the unbounded extraction of a negative phrase is very difficult (Sobin, 2003: 184–185). The grammaticality judgement on (7) is Sobin's (2003).

(7)   ?? Not a penny did I say that Mary remembered to bring.   (Sobin, 2003: 185)

If *wh*-interrogatives and NI constructions have parallel analysis, there should be no such individual variation about unbounded extraction of negative phrases.

Let us turn to the evidence against the view that the initial negative expressions in NI and preposed focus constituents are both in [Spec,FocP]. The following pair might appear to show that the adverb *never* moves to the [Spec,FocP] position from the preverbal position in NI constructions.

(8) a.   I have never seen a ghost.
    b.   Never have I seen a ghost.

If the movement from the preverbal position to [Spec,Foc] were possible, nothing would prevent other preverbal adverbs, such as *merely* and *almost* in (9), from moving to the same position.

(9) a.   Kim merely opened the door.
    b.   Kim almost found the solution.

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[1] Haegeman (2000a: 134; 2000b: 46) cites some examples as evidence that the *wh*-phrase and the negative expression compete for the same position [Spec,FocP]. However, my informants do not agree with her judgements on the data.

(10) shows, however, that preverbal adverbs cannot be preposed (Bouma *et al.*, 2001; Kim and Sag, 2002).

(10) a.   *Merely Kim opened the door.   (Kim and Sag, 2002: 386)
     b.   *Almost Kim found the solution.   (Adapted from Bouma *et al.*, 2001: 45)

This contrasting behaviour of *never* and other preverbal adverbials means that the assumption that both the initial negative expression in NI and the preposed focus constituent move to [Spec,FocP] is problematic.
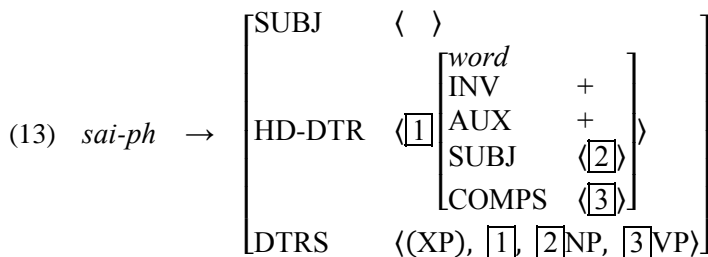
3   An HPSG approach

In this section we look at how our HPSG approach deals with NI sentences. In major analyses of NI it has been argued that the initial negative expression is a sister of the rest of the clause. However, we should notice that nothing can intervene between the initial negative expression and the rest of the clause.

(11) a.   *Never in my life, beans, will I eat.   (Haegeman, 2000a:133)
     b.   *Under no circumstances what would John do for Mary?   (Maekawa, 2006: 230)
     c.   *Not a word on Friday could I find about Smith's negativity.   (Bruening, 2011)

On the basis of this fact we propose a fairly flat structure for NI sentences. In our analysis, NI constructions are characterised by several constraints, organised in the following type hierarchy.

(12)   *sai-ph*
                            |
                      neg-inv-cl

            neg-udc   *neg-non-udc*
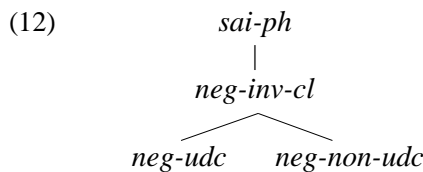
Let us look at each constraint one by one. The first type is *sai-ph*.

(13) *sai-ph* → $\begin{bmatrix} \text{SUBJ} & \langle \ \rangle \\ \text{HD-DTR} & \langle \boxed{1} \begin{bmatrix} word \\ \text{INV} & + \\ \text{AUX} & + \\ \text{SUBJ} & \langle \boxed{2} \rangle \\ \text{COMPS} & \langle \boxed{3} \rangle \end{bmatrix} \rangle \\ \text{DTRS} & \langle (\text{XP}), \boxed{1}, \boxed{2}\text{NP}, \boxed{3}\text{VP} \rangle \end{bmatrix}$

The feature INV(ERTED) distinguishes verbs heading inverted phrases from all other verbs (Ginzburg and Sag, 2000: 29). The [INV +] specification in constraint (13) accommodates the fact that NI sentences have the auxiliary verb and the subject inverted, and if not inverted, the sentence is ungrammatical (*Under no circumstances he will eat raw spaghetti*.). Auxiliaries which are a head of inverted constructions are specified as [AUX +]. Other verbs are [AUX −], and this is why non-auxiliary verbs cannot head NI constructions (*At no time went John to London*.). The '(XP)' in the DTRS list indicates that there might be one more daughter, preceding the other daughters. The type *neg-inv-cl*, given in (14), is a subtype of *sai-ph*.

(14) *neg-inv-cl* → [DTRS $\langle$[NEG +], $\cdots\rangle$]

This constraint states that the first element of NI sentences should be a negative element. We follow Borsley and Jones (2005: 195) in marking negative words, such as *no*, *nobody*, *nothing*, etc., as [NEG +].[2] The sentences in (11) can be excluded by (13) and (14): these constraints ensure that the initial negative expression is immediately followed by the head daughter, so nothing can intervene between them. We assume that NI sentences are divided into two types, characterised as two subtypes of *neg-inv-cl*. The first subtype *neg-udc* (*negative-unbounded-dependency-construction*) is subject to the constraint in (15), and the second subtype *neg-non-udc* (*negative-non-unbounded-dependency-construction*) is constrained by constraint (16).

$$(15) \quad \textit{neg-udc} \quad \rightarrow \quad \begin{bmatrix} \text{HD-DTR} & \langle[\text{SLASH} \quad \{\boxed{1}\}]\rangle \\ \text{DTRS} & \langle[\text{LOC} \quad \boxed{1}], \cdots\rangle \end{bmatrix}$$

$$(16) \quad \textit{neg-non-udc} \quad \rightarrow \quad \begin{bmatrix} \text{DTRS} & \langle[\text{SELECT} \quad \boxed{1}], \cdots, \boxed{1}\text{VP}\rangle \end{bmatrix}$$

The constraint in (15) states that in *neg-udc* structures the first daughter's LOC value is identified with an element in the SLASH set of the head daughter. The constraint in (16) is imposed on the type of NI construction in which the first negative constituent is a modifier. The initial modifier has a non-empty SELECT value, which is identical to the SYNSEM value of the VP.

Let us now consider how the above constraints work for characterising NI sentences. Example (1)a is an instance of *neg-udc*. The structure of an NI sentence in (1)a is given in (17).
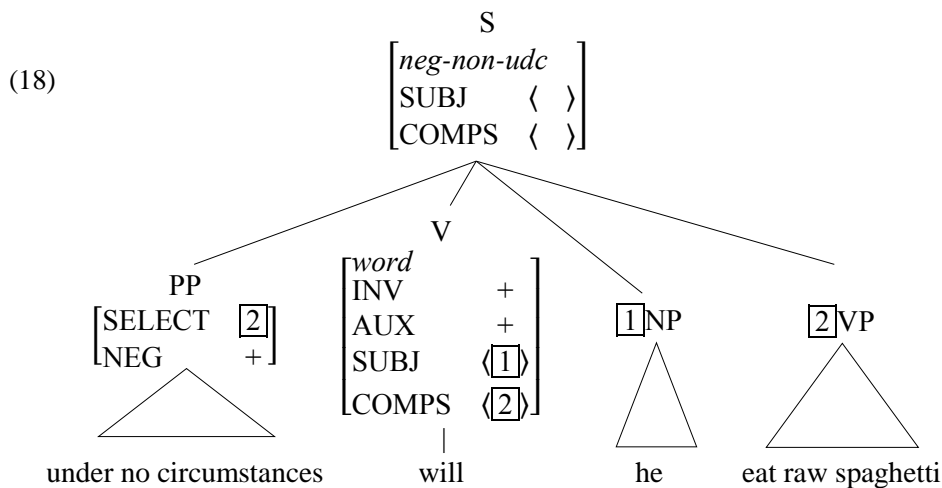
(17)
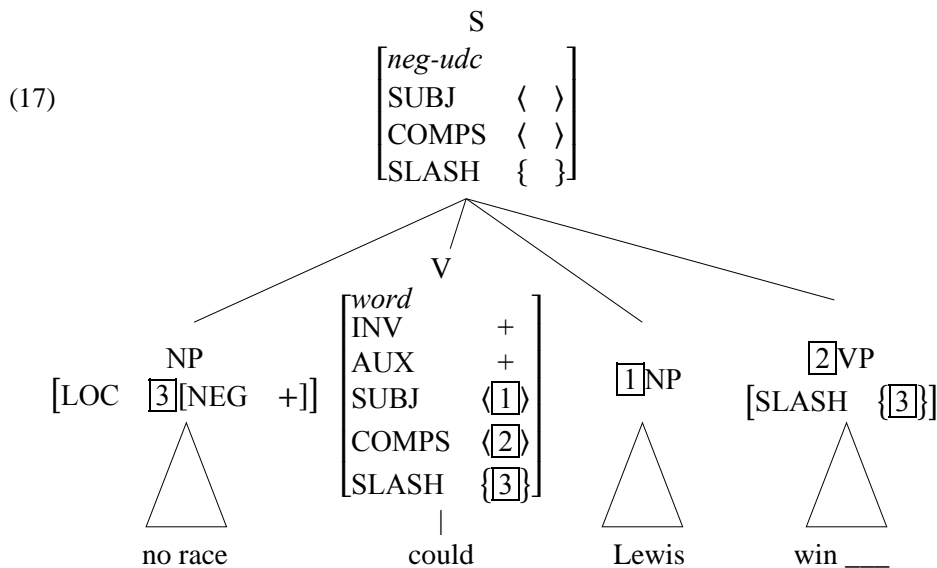
In (17) the object NP of the verb *win* is missing and the information about the missing element is encoded as the SLASH value of the VP. The SLASH value of the auxiliary *could* is $\{\boxed{3}\}$ because the SLASH value of its complement VP is $\{\boxed{3}\}$ (Ginzburg and Sag, 2000: 169). It is discharged by identification with the LOC value of the filler *no race*, which is [NEG +].

Sentence (1)b is an example of the type *neg-non-udc*. The structure for this sentence is given in (18).

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[2] We assume that *seldom*, *rarely* and *only* in the following example are also [NEG +]. The negative polarity item *anything* supports this.

(i)   Seldom/rarely/only on two occasions have I heard anything like that.

(18)

S
$$\begin{bmatrix} \textit{neg-non-udc} \\ \text{SUBJ} \quad \langle \ \rangle \\ \text{COMPS} \quad \langle \ \rangle \end{bmatrix}$$

V

PP
$$\begin{bmatrix} \text{SELECT} \quad \boxed{2} \\ \text{NEG} \qquad + \end{bmatrix}$$

$$\begin{bmatrix} \textit{word} \\ \text{INV} \qquad + \\ \text{AUX} \qquad + \\ \text{SUBJ} \qquad \langle \boxed{1} \rangle \\ \text{COMPS} \quad \langle \boxed{2} \rangle \end{bmatrix}$$

$\boxed{1}$NP $\qquad$ $\boxed{2}$VP

under no circumstances $\qquad$ will $\qquad$ he $\qquad$ eat raw spaghetti

In (18) the SELECT value of the negative adjunct *under no circumstances* is identical to the VP *eat raw spaghetti*.[3]

4 An account of the facts

We will now look at how the constraints introduced above can accommodate the properties of the NI construction outlined in Section 2, which are problematic for the Minimalist/ Principles-and-Parameters analysis.

4.1 NI with fronted *wh*-phrases

The data in (5)a,b shows that the fronted *wh*-element and negative expression are not in complementary distribution. This fact would be surprising if the fronted *wh*-element and negative expression occupied one and the same position, as the Minimalist/ Principles-and-Parameters analysis assumes.

Notice that the sentences in (5) are *wh*-questions with a *neg-non-udc* structure as their head daughter. Then the grammaticality of the sentence follows: no constraints imposed on *neg-non-udc* prevent it from having a *wh*-filler.

4.2 Preposing of preverbal adverbials

As we saw in Section 2, preverbal adverbials normally cannot be preposed, as illustrated by (10), but a preverbal adverbial *never* can be in the initial position of an NI sentence, as shown in (8)b. Let us first consider the lexical specification of *never*.

(19) a. They [never [read the book]].
   b. They will [never [read the assignment]].
   c. They have [never [been left alone]].
   d. *Never I have seen a ghost

The above data ((19)a-c are from Kim, 2000: 96) shows that *never* is a VP modifier. It can appear before any VP, but it cannot appear in the initial position of the uninverted sentence, as (19)d shows. Thus, the lexical information of *never* is something like the following (cf. Kim and Sag, 2002: 353).

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[3] We assume that NI sentences with the conjunction *nor* in the initial position are also instances of *neg-non-udc*.

(20) $\begin{bmatrix} \text{HEAD} & \begin{bmatrix} adv \\ \text{SELECT} & \text{VP} \end{bmatrix} \end{bmatrix}$

Adverbs with this information select a VP via the SELECT specification. This specification of the modified VP guarantees that *never* combines with a VP and not with a sentence. This excludes (19)d, in which *never* combines with a saturated sentence, not with a VP.

Now let us see how our approach can account for (8)b. We deal with the initial negative adverb in (8)b as an adjunct, not a filler. Thus, (8)b is an example of a *neg-non-udc* structure. Constraint (16) for *neg-non-udc* states that the initial negative adverbial is a modifier of the VP. The following is our analysis of example (8)b.

(21)
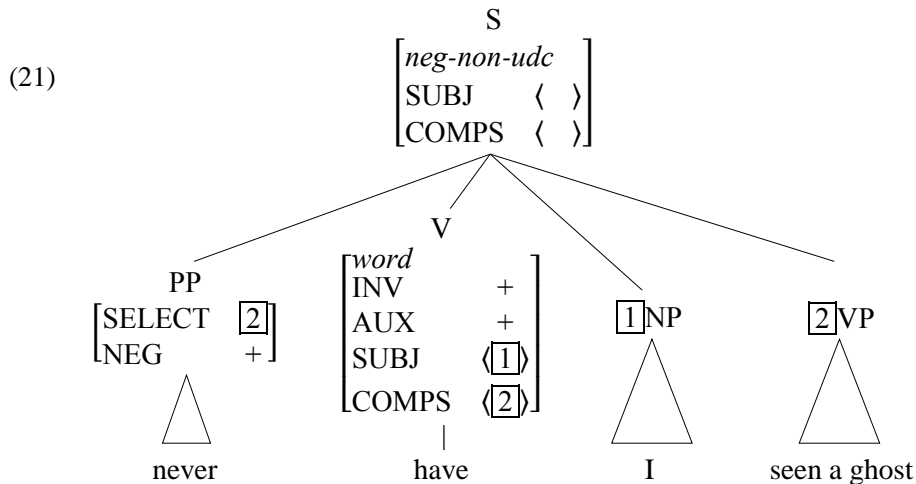
In (21) the SELECT value of the negative adverbial *never* is identical to the VP *seen a ghost*, as with ordinary preverbal adverbials. This is compatible with the lexical information of *never* given in (20).

4.3 Individual variation about unbounded extraction of negative phrases

In this subsection we will give an account to the fact that there is an individual variation as to the possibility of unbounded extraction of a negative phrase in NI. Our analysis can account for the unbounded extraction in sentences like (6) quite naturally in terms of constraint (15) on *neg-udc*. Note that the initial negative phrase *nothing* in (6)a and *no such chemicals* in (6)b corresponds to the complement of *eat* and *were*, respectively, thus missing from the VP. This means that the sentences in (6) are instances of *neg-udc*.

For those who do not accept unbounded extraction of negative expressions, we assume an extra constraint of the following sort imposed on the type *clause*.

(22) $\begin{bmatrix} clause \\ \text{SLASH} & \{\cdots, \boxed{1}, \cdots\} \end{bmatrix} \rightarrow \boxed{1}[\text{NEG} \quad -]$

Constraint (22) is applied to clauses in general (i.e., objects of type *clause*), and it states that if a clause has an extracted element, then it should not be a negative expression.

(23) ??Not a penny did I say that [Mary remembered to bring __].   [= (7)]

In (23) *not a penny* is extracted out of the embedded clause. This means that the SLASH value of the embedded clause contains a [NEG +] element. This violates the constraint in (22). Those who accept unbounded extraction of negative expressions do not have this constraint.

5 Conclusion

In this paper we looked at some pieces of data that are problematic for the Minimalism/Principles and Parameters approach to NI and it was shown that HPSG can provide a fairly straightforward account of the facts.[4] The use of hierarchically organised network of clausal types allows us to accommodate not just the construction-specific properties of NI sentences but also the regularities that they share with other constructions with subject-auxiliary inversion.

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[4] For alternative analyses of NI constructions within HPSG, see Kim and Lee (2009) and Maekawa (2006). It is not clear, however, how the former can accommodate the *neg-udc* constructions of this paper; and the present analysis is much simpler than the latter.