Sentential Negation in French and Conditions on Logical Form in HPSG

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1 Introduction

(1) a. Jean **ne** vient **pas**.
Jean NE comes NM
'Jean doesn't come.'

b. **Personne ne** vient.
nobody NE comes
'Nobody comes.'

2 Data

2.1 *Pas* is always negative

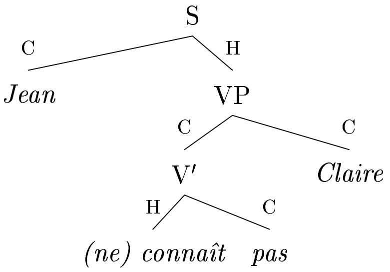
(2) a. Jean (ne) vient **pas**.
Jean NE comes NM
'Jean isn't coming.'

b. Jean (ne) peut **pas** (ne) **pas** connaître Marie.
Jean NE can NM NE NM know Marie
'Jean cannot not know Marie. [he surely knows her.]'

Following the analysis of Abeillé and Godard 1997, Kim and Sag 1996 and Kim 1996, we treat *pas* as a complement in finite clauses and as an adverb in nonfinite clauses.

(3) a. Jean ne connaît pas Claire.
Jean NE knows NM Claire
'Jean doesn't know Claire.'

b.



Our informants do not get the indicated readings in apparently non-negative uses of *pas*:

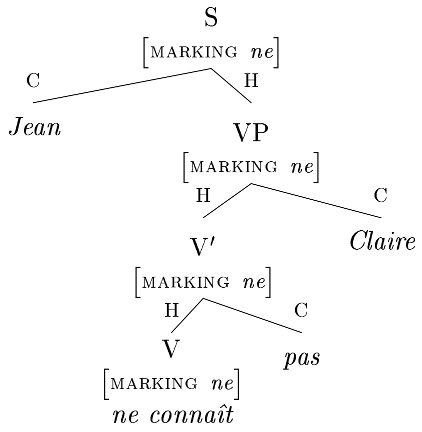
(4) a. Il faut avoir l'esprit plus libre que je ne l'ai **pas**.
it needs have the spirit more free than I NE it have NM
'One must have a freer spirit than I do.' (Racine, after Wilmet 1997, p. 513)

b. Il est plus instruit que je suis **pas**.
he is more instructed than I am NM
'He is better instructed than I am.' (Sturm, 1981, p. 24)

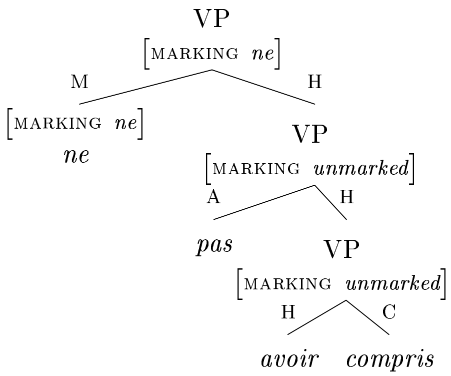
2.2 *Ne* is never negative

Syntactically, *ne* is an affix in finite clauses and a marker in nonfinite clauses (Recourcé, 1996).

(5) a. Jean **ne** connaît *(*pas*) Claire.



b. Jean affirme de [**ne** *(*pas*) avoir compris].



We distinguish three uses of *ne*:

1. 'Independent *ne*'
2. 'Co-negative *ne*'
3. 'Expletive *ne*'

'Independent *ne*' is restricted to certain verbs or constructions (Grevisse and Goosse, 1993; Jones, 1996):

(6) Jean **ne** *peut*/ *veut venir.
Jean NE can/ wants to come
'Jean can't come.'

(7) a. *Si* je **n'**avais pris la voiture, l'accident ne serait pas arrivé.
if I NE had taken the car, the accident NE was NM happened
'If I had not taken the car, the accident would not have happened.'

b. Il y a longtemps *que* je **ne** l'ai vu.
it there has long time that I NE him have seen
'I haven't seen him in a long time.'

If 'independent *ne*' is negative then:

- it must always be selected by a particular construction/verb;
- it must be excluded from all environments in which it is not selected.

If 'independent *ne*' is not negative, then:

- it must always be selected by a particular construction/verb;
- the negation must be an inherent property of these constructions/verbs.

We conclude that semantically, 'independent *ne*' is not negative.
'Co-negative *ne*' cannot be the only overt expression of negation in a clause.

(8) Jean **ne** vient *(*pas*).
Jean NE comes NM
'Jean doesn't come.'

It is optional in spoken language (Sturm, 1981):

(9) a. Jean (**ne**) vient *pas*.
Jean NE comes NM
'Jean doesn't come.'

b. *Personne* (**ne**) vient.
nobody NE comes
'Nobody comes.'

'Expletive *ne*' is restricted to certain constructions.

(10) a. Je *doute* qu'il (***ne**) vienne.
I doubt that he NE comes
'I doubt he is coming.'

b. Xavier ne *doutait pas* qu'il **ne** fît semblant de lire.
Xavier NE doubted NM that he NE made seeming to read
'Xavier didn't doubt that he was pretending to read.'

c. *Douterez*-vous que Canova et Rossini **ne** soient de grands artistes?
will-doubt you that Canova and Rossini NE are some great artists
'Will you deny that Canova and Rossini are great artists?'

We conclude that in all three uses, *ne* has an empty semantic contribution. Distributionally, we can generalize over all three contexts and identify them as negative polarity contexts.

2.3 N-words

(11) Jean n'a parlé à **personne**.
Jean NE has talked to nobody
'Jean hasn't talked to anyone.'

(12) **Personne** n'a **rien** dit. [single negation (SN), double negation (DN)]
nobody NE has nothing said
'Nobody said anything.' [SN]
'Nobody said nothing.' [DN]

(13) Il est *impossible* qu'**aucun** d'eux boive d'alcool.
it is impossible that none of them drinks alcohol
'It is impossible that any of them drinks alcohol.'

(14) **Personne** n'est *pas* venu. [DN]
nobody NE is not come
'Nobody did not come.'

3 Implications of the Data for an Analysis

Properties of the ideal analysis:

1. For each n-word, there is only one logical form.
2. The distribution of n-words is characterized in terms of entailment properties (Ladusaw, 1980; Zwarts, 1981; Giannakidou, 1997).

The data, however, dictates an analysis which assumes

1. a lexical ambiguity of each n-word, and
2. a characterization of the distribution of n-words in terms of their semantic representations.

3.1 One logical form

(15) a. Personne n'écrit sur Simone Weil.
nobody NE writes about Simone Weil
'Nobody writes about Simone Weil.'

b. J'hésite à rien écrire sur Simone Weil, ...
I hesitate to nothing write about Simone Weil, ...
'I hesitate to write anything about Simone Weil, ...' (Muller, 1991, p. 263)

Note that, in (15a), the n-word contributes negation; in (15b), no negation is present, although there is an n-word.

3.2 Negative concord

If we assume a lexical ambiguity of n-words, which n-word occurs in negative concord readings?

(16) Personne n'a rien vue.
nobody NE has nothing seen
'Nobody saw anything.' [SN]
'Nobody saw nothing.' [DN]

Haegeman and Zanuttini 1991, Ladusaw 1995, and Corblin 1994, among others, argue that for negative concord (NC) readings with n-words, it is inadequate to assume that one n-word is negative and the others are NPIs. **But:**

1. This leads to a non-compositional analysis.
2. The NC reading is optional in French.

Instead, we assume that

in NC constellations, only one n-word is negative.

3.3 Entailment-based vs. representation-based analyses

Can the non-negative variant be treated as a *Negative Polarity Item* (NPI)?
NC does not seem to occur with *pas*. A strong NPI such as *un chat* is only possible in its idiomatic reading with clausemate *pas* (Déprez, 1997).

(17) a. Jean n'a *pas* **rien** vu.
Jean NE has NM nothing seen
$'Jean didn't see anything.' [SN]
'Jean didn't see nothing.' [DN]

b. Je ne vois *pas* **un chat**.
I NE see NM a cat
'I don't see a soul.'

(18) a. *Personne* n'a **rien** vu.
nobody NE has nothing seen
'Nobody saw anything.' [SN]
'Nobody saw nothing.' [DN]

b. *Personne* ne voit **un chat**.
nobody NE sees a cat
'Nobody sees a cat/$ anyone.'

(19) a. Il faut *éviter* que Jean voie **personne**.
it needs avoid that Jean sees nobody
'It must be avoided that Jean sees anybody.'

b. Il faut *éviter* que Jean voie **un chat**.
it needs avoid that Jean sees a cat
'It must be avoided that Jean sees a cat/$ anyone.'

Question: If an NPI n-word like *personne* exists, why is it not licensed by *pas*?
Answer: A non-negative n-word can only be licensed by *pas* in certain contexts.

(20) a. Je n'ai *pas* donné le moindre renseignement **à personne**.
I NE have NM give the least information to nobody
'I didn't give any information to anybody.' [SN]

b. Je n'ai *pas* donné **rien** à qui que ce soit.
I NE have NM given nothing to anyone
$ 'I did not give anything to anyone.' [SN]
'I did not give nothing to anyone.' [DN]

We conclude that some notion of "immediate scope" must be available. An analysis in terms of entailment alone is not possible.

4 Semantics in HPSG

4.1 The semantic representation language

The CONTENT value must be an expression of an appropriate semantic representation language. We choose Ty2 (Gallin, 1975) as the language of our logical forms.

(21) a. From the definition of Ty2:

For each types α and β, for each term ϕ of type $< \alpha, \beta >$ and for each term ψ of type α,

there is a term $\phi(\psi)$ of type β.

b. The corresponding parts of the HPSG grammar:

1. In the signature ("sort hierarchy" and "feature declarations"):

term
TYPE *type*

... *appl* ...
FUNC *term*
ARG *term*

2. In the theory (“set of principles”):

$$appl \rightarrow \left[\begin{array}{ll} \text{TYPE} & \boxed{2} \\ \text{FUNC TYPE} & \left[\begin{array}{ll} \text{IN} & \boxed{1} \\ \text{OUT} & \boxed{2} \end{array}\right] \\ \text{ARG TYPE} & \boxed{1} \end{array}\right]$$

where

- the FUNC value corresponds to ϕ,
- the ARG value corresponds to ψ,
- $\boxed{1}$ correponds to the semantic type α, and
- $\boxed{2}$ corresponds to the semantic type β.

(22) a. $\lambda v_{1,<e,t>}.\neg\exists v_{1,e}[v_{1,<e,t>}(v_{1,e})]$

b. subterm tree:

- $\lambda v_{1,<e,t>}.\neg\exists v_{1,e}[v_{1,<e,t>}(v_{1,e})]$
  - $\boxed{4} = v_{1,<e,t>}$
    - $\boxed{5} = 1$
    - $\boxed{1} = <e,t>$
      - $\boxed{2} = e$
      - $\boxed{3} = t$
  - $\neg\exists v_{1,e}[v_{1,<e,t>}(v_{1,e})]$
    - $\exists v_{1,e}[v_{1,<e,t>}(v_{1,e})]$
      - $\boxed{6} = v_{1,e}$
        - $\boxed{5} = 1$
        - $\boxed{2} = e$
      - $v_{1,<e,t>}(v_{1,e})$
        - $\boxed{4} = v_{1,<e,t>}$
          - $\boxed{5} = 1$
          - $\boxed{1} = <e,t>$
            - $\boxed{2} = e$
            - $\boxed{3} = t$
        - $\boxed{6} = v_{1,e}$
          - $\boxed{5} = 1$
          - $\boxed{2} = e$

c. AVM description:

$$\left[\begin{array}{ll} \multicolumn{2}{l}{\textit{abstraction}} \\ \text{VAR} \; \boxed{4} & \left[\begin{array}{ll} \multicolumn{2}{l}{\textit{variable}} \\ \text{TYPE} \; \boxed{1} & \left[\begin{array}{ll} \multicolumn{2}{l}{\textit{complex-type}} \\ \text{IN} & \boxed{2}\ \textit{entity} \\ \text{OUT} & \boxed{3}\ \textit{truth} \end{array}\right] \\ \text{NUMBER} \; \boxed{5} & \left[\begin{array}{ll} \multicolumn{2}{l}{\textit{non-zero}} \\ \text{NUMBER} & \textit{zero} \end{array}\right] \end{array}\right] \\ \text{ARG} & \left[\begin{array}{ll} \multicolumn{2}{l}{\textit{negation}} \\ \text{ARG} & \left[\begin{array}{ll} \multicolumn{2}{l}{\textit{existential}} \\ \text{VAR} \; \boxed{6} & \left[\begin{array}{ll} \multicolumn{2}{l}{\textit{variable}} \\ \text{TYPE} & \boxed{2} \\ \text{NUMBER} & \boxed{5} \end{array}\right] \\ \text{SCOPE} & \left[\begin{array}{ll} \multicolumn{2}{l}{\textit{application}} \\ \text{FUNC} & \boxed{4} \\ \text{ARG} & \boxed{6} \end{array}\right] \end{array}\right] \end{array}\right] \end{array}\right]$$

(23) The relevant part of the lexical entry of negative *personne*:

$$\left[\begin{array}{ll} \multicolumn{2}{l}{\textit{word}} \\ \text{PHON} & \langle \textit{personne} \rangle \\ \text{SYNS LOC CONT} & \lambda P.\neg\exists x[P(x)] \end{array}\right]$$

(24) The relevant part of the lexical entry of *pas*:

$$\left[\begin{array}{ll} \multicolumn{2}{l}{\textit{word}} \\ \text{PHON} & \langle \textit{pas} \rangle \\ \text{SYNS LOC} & \left[\begin{array}{ll} \text{CAT MARKING} & \textit{unmarked} \\ \text{CONT} & \lambda p.\neg p \end{array}\right] \end{array}\right]$$

4.2 HPSG principles of Ty2

We only allow functional application for the combination of logical forms at phrase level.

(25) SEMANTICS PRINCIPLE (informal):

The CONT value of a *phrase* is the result of functional application of the CONT formula of one daughter to the CONT formula of the other daughter.

(26) SEMANTICS PRINCIPLE (first approximation)

$$
\textit{phrase} \rightarrow \begin{bmatrix} \textsc{synsem} & \begin{bmatrix} \textsc{loc content} & \begin{bmatrix} \textit{application} \\ \textsc{func} \ \boxed{3} \\ \textsc{arg} \ \boxed{4} \end{bmatrix} \end{bmatrix} \\ \textsc{dtrs} & \begin{bmatrix} \textsc{head-dtr synsem loc content} & \boxed{1} \\ \textsc{nonhead-dtr synsem loc content} & \boxed{2} \end{bmatrix} \end{bmatrix}
$$
$$
\textbf{and} \left(\begin{array}{c} (\boxed{1} = \boxed{3} \quad \textbf{and} \quad \boxed{2} = \boxed{4}) \\ \textbf{or} \\ (\boxed{1} = \boxed{4} \quad \textbf{and} \quad \boxed{2} = \boxed{3}) \end{array} \right)
$$

(27) a. Personne ne vient.
nobody NE comes
'Nobody comes.'

b.
$$
\begin{array}{ccc}
 & \text{S} & \\
 & \begin{bmatrix} \textsc{phon} & \langle \textit{personne, ne vient} \rangle \\ \textsc{syns loc cont} & (\lambda P.\neg\exists x[P(x)])(\lambda y.\mathsf{come}'(y)) \end{bmatrix} & \\
\text{C} & & \text{H} \\
\text{NP} & & \text{V} \\
\begin{bmatrix} \textsc{phon} & \langle \textit{personne} \rangle \\ \textsc{syns loc cont} & \lambda P.\neg\exists x[P(x)] \end{bmatrix} & & \begin{bmatrix} \textsc{phon} & \langle \textit{ne vient} \rangle \\ \textsc{syns loc cont} & \lambda y.\mathsf{come}'(y) \end{bmatrix}
\end{array}
$$

(28) SEMANTICS PRINCIPLE (final version)

$$
\textit{phrase} \rightarrow \begin{bmatrix} \textsc{synsem} & \begin{bmatrix} \textsc{loc content} \ \boxed{5} \end{bmatrix} \\ \textsc{dtrs} & \begin{bmatrix} \textsc{head-dtr synsem loc content} & \boxed{1} \\ \textsc{nonhead-dtr synsem loc content} & \boxed{2} \end{bmatrix} \\ \beta\textsc{-reduction} & \begin{bmatrix} \textsc{input} & \begin{bmatrix} \textit{application} \\ \textsc{func} \ \boxed{3} \\ \textsc{arg} \ \boxed{4} \end{bmatrix} \\ \textsc{output} \ \boxed{5} & \end{bmatrix} \end{bmatrix}
$$
$$
\textbf{and} \left(\begin{array}{c} (\boxed{1} = \boxed{3} \quad \textbf{and} \quad \boxed{2} = \boxed{4}) \\ \textbf{or} \\ (\boxed{1} = \boxed{4} \quad \textbf{and} \quad \boxed{2} = \boxed{3}) \end{array} \right)
$$
$$
\textbf{and } \texttt{redex-free}(\boxed{5})
$$

(29)
$$
\begin{array}{ccc}
 & \text{S} & \\
 & \begin{bmatrix} \textsc{phon} & \langle \textit{personne, ne vient} \rangle \\ \textsc{syns loc cont} & \boxed{1}\ \neg\exists x.[\mathsf{come}'(x)] \\ \beta\textsc{-reduction} & \begin{bmatrix} \textsc{input} & (\lambda P.\neg\exists x[P(x)])(\lambda y.\mathsf{come}'(y)) \\ \textsc{output} & \boxed{1}\ \neg\exists x.[\mathsf{come}'(x)] \end{bmatrix} \end{bmatrix} & \\
\text{C} & & \text{H} \\
\text{NP} & & \text{V} \\
\begin{bmatrix} \textsc{phon} & \langle \textit{personne} \rangle \\ \textsc{syns loc cont} & \lambda P.\neg\exists x[P(x)] \end{bmatrix} & & \begin{bmatrix} \textsc{phon} & \langle \textit{ne vient} \rangle \\ \textsc{syns loc cont} & \lambda y.\mathsf{come}'(y) \end{bmatrix}
\end{array}
$$

We assume a flexible type shifting system à la Hendriks 1993 and implement it as object level lexical rules in the sense of Meurers 1995. In order to distinguish them terminologically from meta level lexical rules, we call them *derivational rules* (DRs).

(30) The Quantifier Raising Derivational Rule (QR-DR)

$$\begin{bmatrix} \textit{word} & \\ \text{SYNS LOC CONT} & \lambda x_1 \ldots \lambda x_i \ldots \lambda x_n.\phi \end{bmatrix} \Longrightarrow$$

$$\begin{bmatrix} \textit{word} & \\ \text{SYNS LOC CONT} & \lambda x_1 \ldots \lambda X_i \ldots \lambda x_n.X_i(\lambda x_i.\phi) \end{bmatrix}$$

(31) The Adjunct-Introduction DR (AI-DR):

$$\begin{bmatrix} \textit{word} & \\ \text{SYNS L} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} & \\ \text{VFORM} & \textit{finite} \end{bmatrix} \\ \text{VAL} & \text{COMPS } \boxed{1} \\ \text{MARKING} & \textit{unmarked} \end{bmatrix} \\ \text{CONT} & \lambda x_1 \ldots \lambda x_n.\phi \end{bmatrix} \end{bmatrix} \Longrightarrow$$

$$\begin{bmatrix} \textit{word} & \\ \text{SYNS L} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{VAL} & \text{COMPS} \left\langle \begin{bmatrix} \textit{synsem} & \\ \text{L CAT H MOD L CAT MARKING} & \boxed{2} \end{bmatrix} \middle| \boxed{1} \right\rangle \\ \text{MARKING} & \boxed{2} \end{bmatrix} \\ \text{CONT} & \lambda a \lambda x_1 \ldots \lambda x_n.a(\phi) \end{bmatrix} \end{bmatrix}$$

See Richter and Sailer 1999a for the technical details of the formalization of Ty2 as our semantic representation language, and also for the technicalities of the formalization of the COLLOCATION PRINCIPLE and the lexical entries of the next section. Our logical language of choice is RSRL (Richter et al., 1999; Richter, 1999).

4.3 A theory of collocations

Signs exhibit idiosyncratic distributional properties. We capture them in a theory of collocations (van der Wouden, 1992, 1997).

(32) **Definition** (van der Wouden, 1997, p. 5)

Collocation: idiosyncratic restriction on the distribution of lexical items.

Two examples:

(33) *Idiomatically Combining Expressions* following Nunberg et al. 1994:

Peter spilled the beans.
Peter divulged the information

(34) French *body-part anaphors* following Koenig 1999:

Il haussait **le menton**, comme si **le cou** *lui* avait fait du mal.
he raised the chin, as if the neck to.him had caused some pain

'He was raising his head as if his neck hurt him.' (Koenig, 1999, p. 270)

(35) **Theory of Collocations**

- A list-valued feature COLL(OCATION) is appropriate for *signs*.
- For "regular" phrases, the COLL value is the empty list. For most words and for idioms such as *by and large* or *kick the bucket*, it is a non-empty list.
- If the COLL value is a non-empty list, then its value specifies the context(s) that allow(s) the occurrence of the sign.
- A collocation specification indicates two things:
  1. a **licensing domain** (LD): the domain in which the collocation condition must hold (e.g., the minimal clause that contains the sign).
  2. a **licensing context** (LC): the context which satisfies the collocation condition (e.g., the CONTENT value of the licensing domain).
- For every possible licensing domain d, a general COLLOCATION PRINCIPLE states that d contains a licensing context for all signs that must be licensed within d. (Richter and Sailer, 1999a,b).

Reconsider the two examples:

(36) Idiomatically Combining Expressions:

Nunberg et al. 1994 introduce new semantic constants; call them $\mathsf{spill\text{-}divulge}'$ and $\mathsf{beans\text{-}information}'$. The CONTENT value of the sentence in (33) is then

(37) $\exists x[\mathsf{beans\text{-}information}'(x) \wedge \mathsf{spill\text{-}divulge}'(p, x)]$

For *spill* in the meaning of $\mathsf{spill\text{-}divulge}'$ and *beans* in the meaning of $\mathsf{beans\text{-}information}'$:

LD: The minimal complete clause.

LC: The CONTENT contains a quantifier Q that binds a variable x such that $\mathsf{beans\text{-}information}'$ is in the restrictor of Q and for some y, $\mathsf{spill\text{-}divulge}'(y, x)$ is in the nuclear scope of Q. I.e.:

$$Qx[[\ldots \mathsf{beans\text{-}information}'(x) \ldots] \circ [\ldots \mathsf{spill\text{-}divulge}'(y, x) \ldots]]$$

(38)

$$\left[\textsc{synS loc cont}\ \boxed{1}\ \exists x[\mathsf{beans\text{-}information}'(x) \wedge \mathsf{spill\text{-}divulge}'(p, x)]\right]$$

C:
$$\begin{bmatrix} \textsc{phon} & \langle \textit{Peter} \rangle \\ \textsc{s l cont} & p \\ \textsc{coll} & \textit{elist} \end{bmatrix}$$

H:
$$\left[\textsc{s l cont}\ \lambda v.\exists x[\mathsf{beans\text{-}information}'(x) \wedge \mathsf{spill\text{-}divulge}'(v, x)]\right]$$

C:
$$\begin{bmatrix} \textsc{phon} & \langle \textit{the, beans} \rangle \\ \textsc{s l cont} & \lambda P.\exists x[\mathsf{beans\text{-}information}'(x) \wedge P(x)] \\ \textsc{coll} & \left\langle \begin{bmatrix} \textit{min-clause} \\ \textsc{lic}\ \boxed{1}\ \delta \end{bmatrix} \right\rangle \end{bmatrix}$$

H:
$$\begin{bmatrix} \textsc{phon} & \langle \textit{spilled} \rangle \\ \textsc{s l cont} & \lambda U \lambda v.U(\lambda u.\mathsf{spill\text{-}divulge}'(v, u)) \\ \textsc{coll} & \left\langle \begin{bmatrix} \textit{min-clause} \\ \textsc{lic}\ \boxed{1}\ \delta \end{bmatrix} \right\rangle \end{bmatrix}$$

$$\text{where } \delta = \begin{bmatrix} \textit{quantifier} & \\ \textsc{var} & \boxed{2} \\ \textsc{scope} & \begin{bmatrix} \textit{logical-const} & \\ \textsc{arg1}\ \pi_1 & \begin{bmatrix} \textit{application} & \\ \textsc{func} & \textit{beans-information} \\ \textsc{arg} & \boxed{2} \end{bmatrix} \\ \textsc{arg2}\ \pi_2 & \begin{bmatrix} \textit{application} & \\ \textsc{func} & \begin{bmatrix} \textit{application} & \\ \textsc{func} & \textit{spill-divulge} \\ \textsc{arg} & \boxed{2} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix} \quad \text{(with } \pi_1 \text{ and } \pi_2 \text{ strings of attributes)}$$

(39) Body-part anaphors:

LD: *"If an anaphor is a minimal nucleus anaphor, it must be bound within its minimal complete nucleus."* (Koenig, 1999, p. 272)
LD: the minimal complete nucleus that contains the body-part noun.

LC: *"If a phrase is headed by a body-part-noun, the body-part must be instrumental in its antecedent's referent satisfying its semantic role."* (Koenig, 1999, p. 272).
LC: the body-part noun must be bound within its LD and a certain semantic relation must hold.

For all n-words in French, there is a COLL value that specifies the minimal clause in which they are contained as their licensing domain. The CONTENT value of the minimal clause is their licensing context.

5 The Analysis

(40) n-words (*personne*):

negative	CONT:	$\lambda P.\neg\exists x[P(x)]$
	COLL:	none
non-negative	CONT:	$\lambda P.\exists x[P(x)]$
	COLL:	$\neg Op\ y \ldots \exists x \ldots$

(where $Op\ y$ is a logical operator that binds a variable, i.e., λ, $\exists$ or $\forall$)

(41) Example of a lexical entry of non-negative *personne*::

$$\begin{bmatrix} \textit{word} & \\ \text{PHON} & \langle \textit{personne} \rangle \\ \text{SYNS L CONT} & \lambda P.P(x) \\ \text{COLL} & \left\langle \begin{bmatrix} \textit{cc} \\ \text{LIC } \boxed{1}\ \textit{term} \end{bmatrix} \right\rangle \end{bmatrix}$$

$$\wedge\ \exists v \exists w \left(\begin{array}{l} \texttt{component}\left({}^{v}\begin{bmatrix} \textit{neg} \\ \text{ARG } \boxed{2} \end{bmatrix}, \boxed{1} \right) \\ \wedge\ \texttt{component}\left({}^{w}\begin{bmatrix} \textit{exists} \\ \text{VAR } x \end{bmatrix}, v \right) \ \wedge\ \neg\ w = \boxed{2} \end{array} \right)$$

(42) The lexical entry of the marker *ne*:

$$\begin{bmatrix} \textit{word} & \\ \text{PHON} & \langle \textit{ne} \rangle \\ \text{SYNS L} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{marker} \\ \text{SPEC V}[\textit{inf}] \end{bmatrix} \\ \text{MARKING} & \textit{NE} \end{bmatrix} \\ \text{CONT} & \lambda p.p \end{bmatrix} \\ \text{COLL} & \left\langle \begin{bmatrix} \textit{cc} \\ \text{LIC } \boxed{1}\ \textit{term} \end{bmatrix} \right\rangle \end{bmatrix}$$

$$\wedge\ \texttt{contains-event-negation}(\boxed{1})$$

The relation `contains-event-negation` holds of a *term* object iff the main event in that *term* is negated. In a fully developed semantic analysis, the logical forms would contain explicit event variables. Using these variables, it could be determined whether an event is in the scope of a negation or not.

(43) The lexical entry of *pas*:

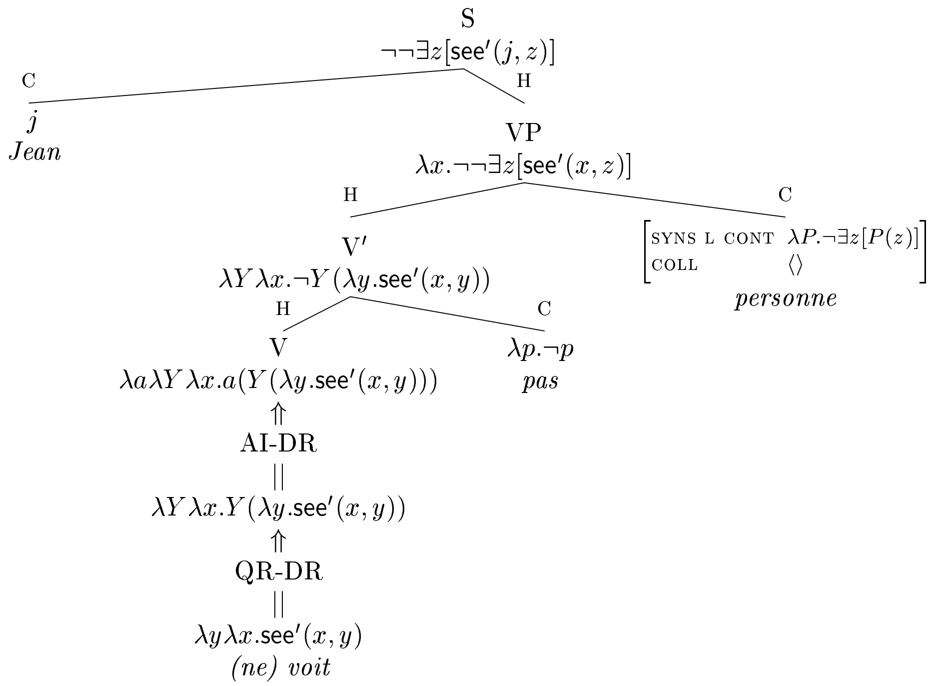
$$\begin{bmatrix} \text{PHON} & \langle \textit{pas} \rangle \\ \text{SYNS L} & \begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{adj} \\ \text{MOD V}[\textit{unmarked}] \end{bmatrix} \\ \text{CONT} & \lambda p.\neg p \end{bmatrix} \end{bmatrix} \\ \text{COLL} & \textit{elist} \end{bmatrix}$$

(44) Jean ne voit pas personne.
Jean NE sees NM nobody

$ 'Jean doesn't see anybody.' [SN]
'Jean doesn't see nobody.' [DN]

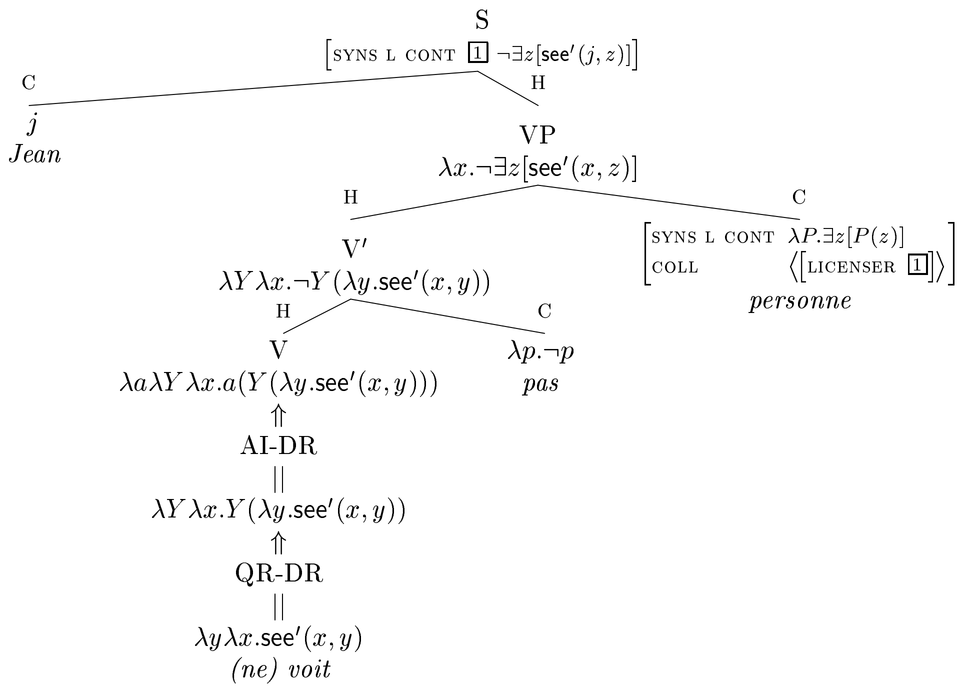
The DN reading:

(45)



The (unavailable) SN reading:

(46)



In $\boxed{1}$, the variable introduced by the n-word is in the immediate scope of the negation ($\neg$). This violates the collocation restrictions of positive n-words.

(47) Personne ne voit rien.
nobody NE sees nothing

'Nobody sees anything.' [SN]
'Nobody sees nothing.' [DN]

The SN reading:

(48)

S
$\left[\text{SYNS L CONT } \boxed{1}\ \neg\exists u \exists z[\mathsf{see}'(u,z)]\right]$

C: $\lambda Q.\neg\exists u.[Q(u)]$
Personne

H: VP
$\lambda x.\exists z[\mathsf{see}'(x,z)]$

H: V
$\lambda Y \lambda x.Y(\lambda y.\mathsf{see}'(x,y))$
$\Uparrow$
QR-DR
$||$
$\lambda y \lambda x.\mathsf{see}'(x,y)$
(ne) voit

C: $\begin{bmatrix} \text{SYNS L CONT} & \lambda P.\exists z[P(z)] \\ \text{COLL} & \left\langle \left[\text{LICENSER } \boxed{1}\right] \right\rangle \end{bmatrix}$
rien

The quantifier introduced by the negative n-word *personne* in subject position ($\exists u$) intervenes between the negation ($\neg$) and the quantifier introduced by the positive n-word *rien* ($\exists z$). The collocation restrictions of the positive n-word are satisfied.

6 Conclusions

- French n-words are systematically ambiguous. There is one variant that contains negation lexically, and one that does not.
- HPSG's CONTENT value must be regarded as the logical form of signs. We choose Ty2 as our semantic representation language. Since a syntactic notion of "immediate scope" is empirically needed, an entailment-based analysis cannot predict the data.
- We observe a great variety of distributional idiosyncrasies of the individual n-words. In the appendix, we list three types of n-words that have differing distributional properties. At the same time, they do not differ semantically: All three types of n-words are lexically ambiguous in the way that we have described above for *personne*.
- The distribution of French n-words should be accounted for by a theory of collocations (which is needed independently in grammar). The logical form of the clause that contains the n-word is the relevant licensing context of the n-word. Each n-word demands a certain logical form in whose context it can appear.
- With the collocation theory we can account for the distributional differences between different classes of n-words that do not differ in their logical form(s). A lexical collocation approach makes it possible to account for very subtle contrasts among single n-words. Variation between dialects or styles can be formulated in terms of differing collocation conditions or in terms of the presence or absence of particular lexical items and is not necessarily due to deep differences in the grammatical system.
- Any alternative analysis that aspires to cover a similar range of data faces the problem of the idiosyncratic behavior of different n-words. It is unclear how any analysis could predict the data correctly if it does not take lexical collocation conditions into account, unless it introduces corresponding lexical specifications that are essentially designed to fulfill the same task.

Appendix: Different Types of N-words

(49) a. n1-words:

Jean n'a parlé à **personne**.
Jean NE has talked to nobody

'Jean hasn't talked to anyone.'

b. n2-words:

Jean n'a dit **mot**.
Jean NE has said word

'Jean said nothing.'

c. n3-words:

Jean n'a parlé à **âme qui vive**.
Jean NE has talked to a living soul

'Jean hasn't talked to a living soul.'

(50) Two n-words:

a. **Personne** n'a **rien** dit. [SN, DN]
nobody NE has nothing said

'Nobody said anything.' [SN]
'Nobody said nothing.' [DN]

b. **Personne** n'a dit **mot**. [SN]
nobody NE has said word

'Nobody said anything.' [SN]

c. **Personne** n'a **jamais** rencontré **âme qui vive** dans cet endroit désert. [SN]
nobody NE has never met a living soul in this place deserted

'Nobody has ever met anyone in this deserted place.'

(51) Non-negative uses:

a. Il est impossible qu'**aucun** d'eux boive d'alcool.
it is impossible that none of them drinks alcohol

'It is impossible that any of them drinks alcohol.'

b. Il est impossible qu'il dise **mot**.
it is impossible that he says word

'It is impossible that he says anything.'

c. C'est à peine si j'ai aperçu **âme qui vive.**
it is hardly if I have perceived a living soul

'I hardly saw anyone.'

(52) One n-word with *pas*:

a. **Personne** n'est pas venu. [DN]
nobody NE is not come

'Nobody did not come.'

b. * Il ne dit pas **mot**.
he NE says not word

c. Il n'y a pas **âme qui vive** dans cet endroit désert. [SN]
it NE there has not a living soul in this deserted place
'There is no one in this deserted place.'

A sketch of the analysis:

(53) a. n1-words (*personne*):

negative	CONT:	$\lambda P.\neg\exists x[P(x)]$
	COLL:	none
positive	CONT:	$\lambda P.\exists x[P(x)]$
	COLL:	$\neg Op\ y \ldots \exists x \ldots$

(where $Op\ y$ is a logical operator that binds a variable, i.e. λ, $\exists$ or $\forall$.)

b. n2-words (*mot*):[1]

negative	CONT:	$\lambda P.\neg\exists x[P(x)]$
	COLL:	$* \neg \ldots \exists x \ldots$
positive	CONT:	$\lambda P.\exists x[P(x)]$
	COLL:	$\neg Op\ y \ldots \exists x \ldots$

c. n3-words (*âme qui vive*):

negative	CONT:	$\lambda P.\neg\exists x[P(x)]$
	COLL:	$* \neg \ldots \exists x \ldots$
positive	CONT:	$\lambda P.\exists x[P(x)]$
	COLL:	$\neg \ldots \exists x \ldots$

A detailed discussion of the analysis, including its formalization, can be found in Richter and Sailer 1999a.

[1]For n2-words, there is an extra collocational restriction that makes them combine only with certain types of events. In the case of *mot* (*word*), the restriction is to events of saying.

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