Global Positive Polarity Items and Obligatory Exhaustivity*

Benjamin Spector
Institut Jean Nicod – CNRS – ENS – EHESS

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Abstract I argue for a distinction between two types of positive polarity items (PPIs) which has not been recognized so far. While for some PPIs, anti-licensing is a strictly local phenomenon, for other PPIs anti-licensing should be stated as a *global* condition.

I aim to contribute to a principled explanation for the distribution of a significant subset of global PPIs, by relating it to specific semantic properties of the relevant items. More specifically, I argue that PPIs such as *soit . . . soit . . .* , *quelques* and *almost* trigger obligatory exhaustivity effects and scalar inferences, and that independently motivated constraints regarding the generation of such inferences can account for their distribution. The paper also briefly addresses the case of other global PPIs, e.g. *at least*, for which a similar account is not straightforwardly available.

1 Introduction

This paper has two goals. First, it argues for a distinction between two types of positive polarity items (PPIs) which has not been recognized so far. While for some PPIs, anti-licensing is a strictly local phenomenon, as discussed, e.g., in Szabolcsi (2004) (e.g. *some*, *someone*, *somewhere*, *already*, *still*, simple disjunction in Hungarian – cf Szabolcsi 2002 – and in French), for other PPIs anti-licensing should be stated as a *global* condition (primarily 'complex' disjunctions such as French *soit . . . soit . . .* and its counterparts and many languages, *almost*, French *quelques*, *at least*, *approximately*, . . .). That is, the latter type (henceforth *global PPIs*) consists of PPIs that are anti-licensed if and only if their global syntactic environment satisfies a certain semantic property – roughly, downward-entailingness.

Second, I aim to contribute to a principled explanation for these distributional facts, by linking them to specific semantic properties of the relevant items. Focussing first on French *soit . . . soit . . .* (henceforth simply *soit_soit*), I will show that this item triggers exhaustivity effects that are close to being *obligatory* (henceforth I will simply say 'obligatory' in order to simplify the presentation, but see footnote 16 for relevant remarks). Specifically, it obligatorily gives rise to an exhaustivity inference when it occurs in an upward-entailing (UE) environment, and it also gives rise to very robust anti-presuppositions and 'strengthened presuppositions' when it occurs, respectively, in the restrictor of a quantifier or in the scope of a negated factive verb. If we posit that *soit_soit* is licensed *only* when it gives rise to such effects, we can explain both the interpretative facts and the distributional facts, because independently motivated constraints on the distribution of exhaustivity effects will derive the distributional facts. I will discuss the implications of this proposal for current debates about the status of scalar inferences and related exhaustivity effects. The proposal will then be extended to English *almost* and French *quelques*. Finally, items such as *at least* cannot be treated in the same way. I will argue the

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licensing of such modifiers in a given syntactic position is nevertheless related to the availability of scalar inferences associated with the modified element in the very same syntactic position.

The paper is organized as follows. Section 2 provides theoretical background about positive polarity items. Section 3 argues that *soit_soit* (and similar items across languages) is a global PPI in the sense outlined above. Section 4 argues that *soit_soit* triggers obligatory exhaustivity effects, and that constraints on the distribution of the exhaustivity operator correctly predict its syntactic distribution. Section 5 offers an account for the fact that *soit_soit* is licensed in the restrictor of universal and negative quantifiers and in the scope of negated factive predicates. Section 6 argues that English *almost* is a global PPI as well, and that its distribution should also be accounted for in terms of obligatory exhaustification. Section 7 briefly discusses other global PPIs and tentatively suggests that their distribution too is related to that of exhaustivity operators.

Most of the distributional data that I report regarding French *soit_soit* and English *almost* were tested by means of systematic questionnaires, whose results I present in an appendix. In the paper itself, I resort to the traditional way of reporting judgments and contrasts, using standard notations ('?', '??', '*', '#', etc.). These notations have a *relative* character, i.e. they are used to report *contrasts*.

2 Background on Positive Polarity Items

2.1 Core properties of positive polarity items

Positive polarity items are usually identified as such by two defining properties: anti-licensing, and rescuing.

- Anti-licensing: PPIs cannot be interpreted under the immediate scope of a non-embedded sentential negation. That is, (1) cannot be interpreted as meaning that Mary doesn't speak any foreign languages. When felicitous, (1) means that there are some foreign languages that Mary does not speak.

(1)   Mary does not speak some foreign languages

Negation is said to *anti-license* PPIs. While every PPI is anti-licensed by negation and other 'antimorphic' operators,[1] it is usually assumed that some, but not all of them, are anti-licensed by other downward-entailing (henceforth, DE) operators (cf. below and Van der Wouden 1997).

- Rescuing: if the anti-licenser is itself in the scope of a DE-operator, then the

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1 An operator O is antimorphic if it obeys both Morgan laws, i.e. if it validates the following equivalence schemata: $O(p \wedge q) \Leftrightarrow (Op \vee Oq)$ and $O(p \vee q) \Leftrightarrow (Op \wedge Oq)$

PPI is 'rescued' (cf. Szabolcsi 2004 and the references cited therein), i.e. can be interpreted within the scope of the anti-licenser (typically, negation). Thus (2-a) can be interpreted as equivalent to (2-b).

(2)　　a.　If Mary does not speak some foreign languages, she should not travel
　　　　b.　If it is not the case that Mary speaks one foreign language or more, she should not travel

2.2　Types of PPIs

It is claimed (Van der Wouden 1997) that different classes of PPIs have different types of anti-licensers, just like NPIs differ from each other regarding their precise licensing conditions. For instance, *already*, *still*, *someone*, . . . , are assumed to be anti-licensed only by antimorphic or anti-additive operators, but PPIs such as *a little*, *almost*, *relatively*, *rather* are anti-licensed by all DE operators.

　　This characterization of the various classes of PPIs is however not exactly correct. Namely, the restrictor of a universal quantifier defines both a DE and an anti-additive context, and yet *no* PPI is anti-licensed within the restrictor of a universal quantifier. More generally, the restrictor of *every* quantifier fails to anti-license a PPI, whatever its class. Likewise, the antecedent of conditionals, which, on a classical analysis, defines an anti-additive context (hence a DE-context), does not anti-license PPIs. These facts are illustrated in (3).[2]

(3)　　a.　Every student who is still sleeping will fail the exam
　　　　b.　Every student who has almost finished his homework will pass
　　　　c.　Few students who are still sleeping will pass
　　　　d.　If John is still sleeping, he will fail
　　　　e.　If John has almost finished his homework, he will pass

3　The distribution of *soit_soit*.

3.1　Local vs. global anti-licensing

Anti-licensing is widely assumed to be a local phenomenon in the following sense: if the anti-licenser is sufficiently 'far' from the relevant PPI, then the PPI can be interpreted in its scope. For instance, Szabolcsi (2004) points out that in the following sentences, 'someone' and 'something' can be interpreted *in situ*.

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2 These problematic exceptions have a counterpart in the domain of negative polarity items. 'Strong' NPIs (cf. Zwarts 1998) which are supposed to be licensed in anti-additive contexts, fail to be licensed in the restrictor of a universal quantifier or the antecedent of a conditional. See Gajewski (2008) for an interesting perspective on this problem.

(4)   I don't think Mary knows someone here

(5)   It's not possible that Mary ate something

In recent work (Homer, to appear), Homer investigated in depth the locality require-
ments for both the licensing of NPIs and the anti-licensing of PPIs. While he found
strong evidence that the relevant locality conditions vary depending on the identity
of the polarity items, he maintained the view that anti-licensing is generally local in
the following sense: any PPI can be interpreted within the scope of a negation which
is outside of the smallest finite CP which hosts the PPI.

    However, I will argue that for some PPIs anti-licensing is a purely global phe-
nomenon. That is, these PPIs cannot be interpreted under the scope of negation,
however far negation is, unless negation is itself in a DE environment (rescuing). The
right generalization for these PPIs is that they are anti-licensed if and only if their
global syntactic environment meets a certain semantic condition (roughly, DEness).
This class of PPIs, which I will now call *global PPIs*, include French *quelques* (a
plural indefinite determiner, not to be confused with singular *quelqu'un/quelque
chose*), *at least*, *almost*, and the complex disjunctions *soit_soit*, *ou...ou...*, the adverb
approximativement ('approximately'), among others. I will first concentrate on the
relevant facts in the case of French *soit_soit* and English *almost*. PPIs for which
anti-licensing is not global, I will call *local PPIs*.

3.2 *soit_soit* vs. *ou*

soit_soit vs. *ou* constitutes an interesting minimal pair: they have a very similar
meaning (that of a disjunction), but while *ou* is a local PPI, *soit_soit* is a global
PPI. Let me start with *ou*. *Ou* is a (very mild) PPI in the sense that a) it does not
like to be in the immediate scope of negation (cf. (6-a-ii) below), and b) it can
be rescued under the scope of negation if the negation itself is in DE-context (cf.
(6-b)).[3] Furthermore, it is a *local* PPI, since it can be interpreted under the scope of
a negation which is sufficiently far away (cf. (6-c)).[4]

(6)   a.   **Anti-licensing**
               (i)   Marie a invité Léa ou Jean à dîner.

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3 Anti-licensing in the case of *ou* is not perceived as very strong. It has been suggested to me that the
  deviance of (6-a-ii) could be explained in terms of a competition with the *ni ... ni ...* construction
  (roughly equivalent to *neither ... nor ...*). However, the fact that the sentences in (6-b) are not
  perceived as deviant at all would not be predicted by a simple account of this type, since the
  alternative *ni ... ni ...* construction is still possible in these cases.
4 All the reported judgments are to be understood as excluding cases where the relevant negative
  sentences are 'echoic', e.g. used as replies to the corresponding affirmative sentences. PPIs are
  known to be acceptable in the scope of negation in such contexts (cf., e.g., Horn 1989, Carston 1996).

             'Marie invited Lea or Jean for dinner.'

      (ii)   ?? Marie n'a pas invité Léa ou Jean à dîner. [Under a narrow-scope interpretation for disjunction]

             'Paul did not invite Léa ou Jean for dinner.'

  b. **Rescuing**:

      (i)   Si Paul n'avait pas invité Pierre ou Julie à dîner, cela aurait été impoli.

             'If Paul had not invited Pierre or Julie for dinner, that would have been rude.'

      (ii) Il est peu probable que Paul n'ait pas invité Pierre ou Julie à dîner.

             'It is unlikely that Paul did not invite Pierre our Julie for dinner' [understood as 'It is likely that Paul invited either Pierre or Julie for dinner.']

  c. **Locality of anti-licensing**:

      Je ne pense pas que Marie ait invité Pierre ou Julie à dîner.

      'I don't think that Marie invited Pierre or Julie for dinner.' [understood as 'I don't believe Pierre invited either one']

Now, like *ou*, *soit_soit* is anti-licensed by a clause-mate negation, but unlike *ou*, it is anti-licensed by negation even when separated from negation by a CP boundary.

(7) **Long-distance anti-licensing:**

  a. *Je ne pense pas que Jacques ait invité soit Anne soit Paul à dîner [Under a narrow-scope interpretation for disjunction].

      'I don't think that Jacques invited SOIT Anne soit PAUL for dinner'

  b. (i)   *J'ai emmené Marie au cinéma sans qu'elle ait demandé la permission soit à son père soit à sa mère.

            Gloss: *'I have brought Marie to the movie theater without that she have-subjunctive asked permission SOIT from her father SOIT from her mother.'*

      (ii) [As opposed to:] J'ai emmené Marie au cinéma sans qu'elle ait demandé la permission à son père ou à sa mère.

            Meaning: *'I have brought Marie to the movies without her having asked permission from her father or her mother.'*

Furthermore, the verb *douter* ('doubt') anti-licenses *soit_soit*, but not *ou*, in its CP complement, as (8) and (9) illustrate:[5]

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[5] We are of course ignoring irrelevant 'wide-scope' interpretations. With a 1st person subject, a wide-scope interpretation is usually ruled out pragmatically, as it would suggest that the speaker does not know what it is exactly that she finds doubtful.

(8)   a.   Je doute que Nicolas ait mangé les poires ou les oranges.
          'I doubt that Nicolas ate the pears or the oranges.'
      b.   *Je doute que Nicolas ait mangé soit les pommes soit les bananes
          'I doubt that Nicolas ate SOIT the apples SOIT the bananas'

(9)   a.   Je doute qu'il soit utile que Jacques apprenne l'espagnol ou le russe.
          'I doubt that it would-be (subjunctive) useful that Jacques learn (subjunctive)
          Spanish or Russian.'
      b.   *Je doute qu'il soit utile que Paul apprenne soit l'allemand soit le russe.
          'I doubt that it would-be (subjunctive) useful that Paul learn (subjunctive)
          SOIT German SOIT Russian.'

As expected, *soit_soit* can be interpreted in the scope of a negative element if a higher DE operator is present (rescuing):

(10)   [In contrast with (7-b-i)]
       Je n'emmène jamais Marie au cinéma sans qu'elle ait demandé la permission soit à son père soit à sa mère.
       'I never bring Marie to the movies without that she has asked permission SOIT from her father SOIT from her mother.'

(11)   [In contrast with (9-b)]
       (?) Personne ne doute qu'il serait utile que Jean apprenne soit l'anglais soit l'espagnol.
       'Nobody doubts that it would be useful that Jean learn (subjunctive) SOIT English SOIT Spanish.'

Taken together, these facts show that *soit_soit* is a PPI for which anti-licensing is, at the very least, less local than it is for other PPIs such as *ou* or English *some*. Note, in particular, that in sentences such as (9-b), the anti-licenser is separated from *soit_soit* by *two* CP boundaries. Because there is no clear upper bound as to the distance between the anti-licenser and *soit_soit* (modulo parsing limitations), it is reasonable to conclude that in the case of *soit_soit*, anti-licensing is simply not restricted by locality constraints.[6]

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6 In all the above cases of 'long-distance' anti-licensing, the anti-licensers (*ne pense pas*, *doute*) select CP complements in the subjunctive mood. But there are examples of long-distance anti-licensing without this feature. For instance, when *croire* is not negated but its subject is a DE indefinite (such as *few teachers*), its CP complement must be in the indicative mood, and such a case *soit_soit* cannot be interpreted as taking scope within the CP-complement of *croire*:

(i)   *Peu de professeurs croient que Jacques a appris soit l'allemand soit l'italien
      'Few professors believe that Jacques has (indicative) learnt SOIT German SOIT Italian'

On this basis, I conclude that *soit_soit* is anti-licensed by its anti-licensers no matter how far they are. In this sense, anti-licensing in the case of *soit_soit* is *global*. The 'flip-flop' data discussed in section 3.4 further buttress this claim.

3.3 Downward-entailingness is sufficient to anti-license *soit_soit*.

As mentioned above, the relevant logical properties for the licensing and anti-licensing of polarity items vary across different types of polarity items. In the case of *soit_soit*, the relevant property seems to be DEness (at least), as opposed to a more restrictive property (such as anti-licensing by anti-morphic operators only). This is illustrated by the following contrasts, which show that, contrary to *ou*, *soit_soit* is anti-licensed not only by negation but also by other DE elements, both within the same clause ((12) and (13)) and across CP boundaries ((14)).

(12)   [anti-licensing by an antiadditive, non-antimorphic element]
      a.   *Aucun étudiant ne parle soit italien soit allemand.
          'No student speaks SOIT Italian SOIT German'
      b.   Aucun étudiant ne parle espagnol ou anglais
          'No student speaks Spanish or English.'

(13)   [anti-licensing by a monotone-decreasing, non-antiadditive element]
      a.   *Peu de français connaissent soit l'italien soit l'anglais.
          'Few French people know SOIT Italian SOIT English'
      b.   Peu de français connaissent l'allemand ou l'anglais.
          'Few French people know Italian or English'

(14)   [anti-licensing at a distance by a monotone-decreasing, non-antiadditive element.]
      a.   *Il est peu probable que le fugitif ait fui soit en Allemagne soit en Italie.
          'It is little likely that the fugitive fled SOIT to Germany SOIT to Italy.'
      b.   Il est peu probable que le fugitif ait fui en Allemagne ou en Italie.
          'It is little likely that the fugitive fled to Germany or to Italy.'

3.4 Operator anti-licensing and environment anti-licensing

At first sight, the phenomenon of rescuing for PPIs suggests that PPI-anti-licensing depends on the semantic properties of the PPI's syntactic global environment, rather than with the mere presence or absence of an anti-licenser c-commanding it.

Unlike all other judgments pertaining to *soit_soit* reported in this section, this specific judgment was not included in my on-line questionnaire, but was tested informally on several informants.

As discussed in Szabolcsi (2004), Jespersen (1922) viewed PPIs as elements that 'want' to be in a positive environment, where the relevant notion of positivity is semantic: being in the scope of two negative elements would count as being in a positive environment, because the two negations cancel each other.

As appealing as this idea seems to be, Szabolsci (2004) argued against it. One of Szabolcsi's many arguments is that, in cases of rescuing, adding a *third* monotone-decreasing operator does not prevent the PPI from being licensed. However, according to an account *à la* Jespersen, adding a third negative operator should in fact make the whole context negative, hence make a PPI infelicitous. Based on this and other arguments, Szabolsci concludes that anti-licensing should be viewed as a syntactic relation between certain specific operators (e.g. anti-additive operators) and PPIs, and she also argued that rescuing itself should be specified as involving a syntactic relation between the rescuer and the complex structure made up of a negation and a PPI in its scope. According to this view, the anti-licensing of PPIs cannot be stated in terms of the global semantic properties of syntactic environments. Importantly, the anti-licensing of *soit_soit* cannot be captured by a system of the sort Szabolcsi advocates. In particular, while *soit_soit* is 'rescued' when it is in the scope of *two* DE-operators, it appears to be anti-licensed when it is under the scope of *three* subsequent DE-operators.[7] To illustrate this point, consider the following paradigm.

(15)   ['ou' under the scope of 1-DE, 2-DE, and 3 DE- operators]

   a.   **1 DE operator** – Je trouve inimaginable d'habiter à Paris ou à New-York.
       'I find it unconceivable to live in Paris or in New York'

   b.   **2 DE operators** – (?) Je trouve inimaginable de ne pas habiter à Paris ou à New York.
       'I find it unconceivable not to live in Paris or in New York'

   c.   **3 DE operators** – (?) Je ne trouve pas inimaginable de ne pas habiter à Paris ou à New York.
       'I don't find it unconceivable not to live in Paris or in New York'

(16)   [*soit_soit* under the scope of 1-DE, 2-DE, and 3 DE- operators]

   a.   **1 DE operator** – * Je trouve inimaginable d'habiter soit à Paris soit à New-York.
       'I find it unconceivable to live SOIT in Paris SOIT in New York'

   b.   **2 DE operators** – (?) Je trouve inimaginable de ne pas habiter soit à

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7 I thank Vincent Homer for pointing out the relevance of this fact. The distinction between environment-based theories and operator-based theories of polarity item licensing is discussed in depth in Homer (to appear).

Paris soit à New York. *'I find it unconceivable not to live SOIT in Paris SOIT in New York'*

c. **3 DE operators** – * Je ne trouve pas inimaginable de ne pas habiter soit à Paris soit à New York.

'I don't find it unconceivable not to live SOIT in Paris SOIT in New York'

In the case of *ou* (cf. (15)), the global monotonicity of the environment doesn't seem to play any role. In my survey, (cf. section A.4.4 of the appendix), there was no *significant* difference for *ou* depending on whether it was in the scope of one DE or two DE operators, but there is a *tendency* for *ou* to be judged *less* felicitous in the scope of two or three DE-operators than in the scope of just one DE-operator – it may be that, everything else being equal, the relevant sentences are harder to parse when their complexity increases. Something quite different happens for *soit_soit* (cf. (16)). In my survey, the sentences with *soit_soit* that have 1 or 3 DE-operators ((16-a) and (16-c)) were markedly less acceptable than every other sentence in either (15) or (16), while the sentence with 2 DE-operators ((16-b)) received approximately the same rating as its counterpart with *ou* ((15-b)).

This indicates that the monotonicity properties of the global context is what matters in the case of *soit_soit*: as a first approximation, *soit_soit* is anti-licensed if its global syntactic environment is monotone-decreasing.

3.5 Restrictors and negated factive verbs.

The generalization that *soit_soit* cannot occur in globally DE-environments is not entirely correct. First, *soit_soit* is fully acceptable in the restrictor of all quantifiers, even when such restrictors define a DE-environment. In this respect *soit_soit* is no different from other, already documented PPIs. This is illustrated in (17):[8]

(17)   [Chaque étudiant qui a]/[Aucun étudiant qui a]/[Peu d'étudiants qui ont] résolu soit le premier soit le second problème a/ont reçu une bonne note.
'[Every student who has]/[No student who has]/[Few students who have] solved SOIT the first SOIT the second problem has/have received a good grade'

Second, in certain cases where a presuppositional expression, typically a factive verb, intervenes between a DE-operator and *soit_soit*, *soit_soit* is acceptable despite being in a globally DE-environment.[9] This is illustrated by the following contrast, where a negated factive verb is shown not to anti-license *soit_soit* ((18-a)), while a negated non-factive attitude predicate does ((18-b)):

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8 These judgments were not tested in the questionnaire whose results I report in the appendix.

9 More precisely, in such cases, *soit_soit* occurs in a *Strawson*-DE-environment (cf. Von Fintel 1999).

(18)　　a.　Bien qu'elle soit très informée, Léa ne sait pas que Jacques étudiera soit à Yale soit à Princeton.

　　　　　　'Even though she is very well informed, Lea does not know that Jacques will study SOIT at Yale SOIT at Princeton.'

　　　　b.　?? Bien que Jacques soit un étudiant brillant, Anne ne croit pas qu'il étudiera soit à Yale soit à Princeton.

　　　　　　'Even though Jacques is a bright student, Ann does not believe that he will study SOIT at Yale SOIT at Princeton.'

I will address the sources of these apparent exceptions in section 5.

3.6　Other complex disjunctions.

Besides *soit_soit*, there is another complex disjunctive construction in French, in which the simple disjunction *ou* is doubled (*ou . . . ou . . .*). The distribution of this construction seems to be constrained in exactly the same way as that of *soit_soit* is. Many other languages, for instance Italian, allow such complex disjunctive phrases (i.e. *o . . . o . . .* in Italian). According to a few native Italian speakers, these complex disjunctions, unlike simple disjunctions, behave in the same way as *soit_soit* in the relevant respects, i.e. are global PPIs.[10] German[11] also has a complex disjunctive construction (*entweder . . . oder . . .*), which gives rise to parallel judgments.[12]

　　So far, I have shown that the theory of PPI must take into account the distinction between local and global anti-licensing. Focussing on *soit_soit* (and similar items in French and other langauges), I have shown that this item is anti-licensed if its *global* environment is DE, unless it occurs in the restrictor of a quantifier or in the scope of negated factive verb (i.e. a Strawson-DE environment). The next sections aim to explain these distributional facts in terms of an independently motivated constraint that regulates the interpretation of *soit_soit*.

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10 Italian *sia . . . sia . . .* and *sia . . . che . . .* , though etymologycally related to French *soit_soit* have a different meaning: in simple, unembedded cases, both *sia . . . sia . . .* and *sia . . . che . . .* lead to a conjunctive interpretation. See Zamparelli (2000).

11 German judgments were collected from a few German-speaking colleagues and from the audience of a talk given at the University of Frankfurt, in which I presented a first version of this work.

12 Note that the English complex disjunction *either . . . or* is not a PPI, and yet it tends to strengthen exclusivity inferences. I leave this issue for future research.

4   Accounting for the distribution of complex disjunctions: obligatory exhausitification, presupposition strengthening

In this section, we point to another interesting property of complex disjunctions: they tend to force exclusivity inferences or more complex exhaustivity effects. Furthermore, they give rise to strengthened presuppositions when they occur in restrictors or in the scope of factive verbs. I will argue that these properties can explain the distributional facts we have just discussed, given independently motivated constraints regarding the distribution of exhaustivity operators.[13] The ideas developed in this section can be viewed as a development of an intuition present in Mouret (2007). Mouret (2007: p. 201-202) briefly suggests that the fact that *soit_soit* does not like to be interpreted in the scope of negation could be related to the fact that *soit_soit* tends to trigger more robust exclusivity inferences than *ou*, because these exclusivity inferences are scalar implicatures which, like all scalar implicatures, are 'suspended' in DE-environments.

In this paper, I will argue that these inferences arise thanks to the presence in the logical form of sentences of an *exhaustivity operator*. If this is correct, the relevant exhaustivity effects are not conversational implicatures in Grice's sense. I will therefore not call such effects 'scalar implicatures' but will rather use theoretically more neutral terms, such as 'scalar inference' or 'exhaustivity effects'.

4.1   Complex disjunctions and exclusivity inferences

So far, we have shown that the complex disjunction *soit_soit* is a global PPI while the simple disjunction *ou* isn't (even though it is a local PPI). Furthermore, *soit_soit* patterns like a number of complex disjunctions across languages, which suggests that we should look for a principled explanation of this fact. Now, *soit_soit* and *ou* differ along another dimension as well: speakers have a quite clear intuition that *soit_soit* triggers much stronger exclusivity inferences than *ou*.[14]

Evidence that *soit_soit* gives rise to more robust exclusivity inferences than *ou* in unembedded contexts comes from the contrast between the pair in (19) and the one in (20), where each pair is to be understood as a dialogue (these contrasts were gathered in a separate questionnaire with ten native French speakers, and every

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13 This is certainly reminiscent of Chierchia's (2006) approach to polarity licensing, which derives the distribution of NPIs and free-choice items from the assumtion that they are obligatory in the scope of an implicature-computing opertor. The general architecture of my proposal is however quite different. How these two approaches can be unified is a topic I leave for further research . See also Nicolae (2012) for an account of PPI licensing that is inspired by Chierchia (2006). Nicolae (2012) does not talk about the distinction between local and global PPIs and, in fact, deals only with local PPIs.

14 In several French introductions on propositional logic, *soit_soit* is used to illustrate exclusive disjunction, as opposed to inclusive disjunction. See for instance Ruyer (1994: 40).

single participant perceived every single contrast):

(19)   a.   Marie ira au cinéma lundi ou mardi
            'Mary will go to the movies on Monday or Tuesday'
    b.   Absolument ! Et elle ira même à la fois lundi ET mardi
            'Absolutely! She will even go both days'

(20)   a.   Marie ira au cinéma soit lundi soit mardi
            'Mary will go to the movies SOIT on Monday SOIT on Tuesday'
    b. #Absolument! Et elle ira même à la fois lundi ET mardi
            'Absolutely! She will even go on both days'

In both (19) and (20), the reply contradicts the exclusivity inference which is normally triggered by disjunction in the first sentence, but at the same time it has to be understood as asserting that the first sentence is true (due to *absolument*). The fact that such a reply is not infelicitous in the case of (19) is expected, given the standard assumption the exclusivity inference triggered by disjunction is normally optional.[15] The fact that the very same reply leads to infelicity in the case of (20) shows that in the case of *soit_soit*, the exclusivity inference is obligatory.

The following contrast can be used to make the same point:

(21)   Quelles langues étrangères parlent-ils ?
       'Which foreign languages do they speak?'
    a.   Marie parle allemand ou anglais. Paul aussi: il parle même les deux.
           'Mary speaks German or Italien. Paul too: he even speaks both'
    b. #Marie parle soit allemand soit anglais. Paul aussi: il parle même les deux.
           'Mary speaks SOIT german SOIT english. Paul too: he even speaks both'

In both (21-a) and (21-b), the disjunction in the the elided VP has to be inclusive for the whole reply to be consistent. The contrast between (21-a) and (21-b) shows again that while *ou* is fully compatible with an inclusive construal, this is not so in the case of *soit_soit*.

However, *soit_soit* cannot be equated to an exclusive disjunction: when *soit_soit* is in the scope of a universal quantifier, the inferences corresponding to the exclusive

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15 This is not to deny that, in terms of actual processing, there might be a strong tendency to *first* derive the inference and *then* to 'cancel' it. The notion of optionality used here does not pertain to on-line processing, but rather to the fact that a reading without the exclusivity inference *exists* in principle, without which the reply in (19) would feel contradictory. One can compare this case to cases of disambiguation in favor of a less favored meaning, as in: 'John went to the bank to get some money. He always buries money near the river.' It is plausible that 'bank' is first interpreted in the financial sense, but is then reanalyzed as meaning 'river shore' upon hearing the second sentence.

reading are no longer obligatorily present. This is illustrated by the fact that there is no sense of deviance whatsoever in the following dialogue.

(22)   a.   Tous mes étudiants étudient soit l'allemand soit l'anglais
              'Every student of mine studies SOIT German SOIT English'
    b.   Absolument! Et certains étudient même les deux.
              'Absolutely! And some study even both'

On the other hand, the following would be deviant as a reply to (22-a):

(23)   #Absolument! Et ils étudient même les deux
        'Absolutely. And they even study both'

These facts suggest the following generalization for *soit_soit*: *soit_soit* obligatorily triggers the scalar inferences which are normally *optionally* triggered by disjunction. This generalization captures the strong tendency to get an exclusive reading in a non-embedded context. It also captures the facts presented in (22) and (23). In the case of (22), the relevant alternative for exhaustification is given in (24):[16]

(24)   Tous mes étudiants étudient l'allemand *et* l'anglais
        'Every student of mine studies German and *English'*

On the basis of such an alternative, the expected scalar inference for (22-a) is the negation of (24), i.e. 'it is not the case that every student of mine studies both German and English'. Now, this proposition is itself fully compatible with a situation where some students (but not all) study both languages, which explains why (22-b) is a felicitous reply: (22-b) does not contradict the inference. On the other hand, the predicted scalar inference is *not* compatible with the proposition expressed in (23), which is thus correctly predicted to be deviant.

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16 One cannot be sure based on these data that the relevant inferences are truly 'obligatory' rather than simply strongly favored. Strikingly, even in contexts where speakers are *not* supposed to be maximally informative, sentences with *soit_soit* are, to my ear, false if the exclusive inference turns out to be false. Thus consider the 'Master Minds' game, where one has to identify an ordered list of colors. If I know everything relevant, I could help a player by telling her 'the first color or the third color is red', and if both the first and third colors turn out to be red, my hint was certainly not false, though possibly misleading. In contrast with this, my intuition is that if I said 'Soit la première soit la troisième couleur est le rouge', then if both turn out to be red, the player would have ground to complain that I gave her a false indication (see Fox, to appear, for a related argument for the view that exhaustivity effects do not arise as conversational implicatures). In any case, even if the obligatoriness claim were to be weakened, this would not affect the logic of my proposal. The fact that *soit_soit* is degraded in DE-contexts would still be expected if there is a strong preference (rather than an absolute requirement) for *soit_soit* to occur in the scope of an exhaustivity operator. But we would simply expect *soit_soit* to be marginally available there, rather than completely ruled out. We would still expect to find the contrasts we observe.

In connection with (22-a), we should also note that an exclusive construal of *soit_soit*, though not obligatory (as we have just shown), is nevertheless *possible*, as illustrated by the fact that the following dialogue is felicitous as well (in a context where it is known that Marie is one my students):

(25)   a.   Tous mes étudiants étudient soit l'allemand soit l'anglais
                'Every student of mine studies SOIT German SOIT English'
        b.   Non ! Marie étudie les deux !
                'No! Marie studies both !'

This is not unexpected given a theory of exhaustivity inferences where scalar items can retain their strong meaning under the scope of a universal quantifier. As discussed in Chemla & Spector (2011), such theories include both so-called 'localist' theories of scalar inferences and exhaustivity effects (Chierchia, Fox & Spector 2012) which assume that exhaustification does not necessarily apply to full speech acts, but can apply to subsconstituents of sentences, and certain version of 'globalist', neo-Gricean theories (such as Spector 2003, 2007, van Rooij & Schulz 2004, Schulz & van Rooij 2006). In fact, to my ear, the dialogue in (25) would also be felicitous if *soit_soit* were replaced by a simple disjunction. However, there seems to be a difference betwefen the simple disjunction *ou* and *soit_soit*: in many syntactic environments, local strengthening of disjunction seems to be significantly more available with *soit_soit* than with *ou*. For instance, when interpreted in the scope of a necessity modal, *ou* is not easily interpreted as exclusive, while this is clearly a possibility for *soit_soit*.[17] This is illustrated by the following contrast:

(26)   a.   ?# Pour cet examen, nous devons faire le premier ou le deuxième problème. En d'autres termes, il nous est interdit de faire les deux.
                'For this exam, we must solve the first or the second problem. In other words, we are forbidden to solve both.'
        b.   Pour cet examen, nous devons faire soit le premier soit le deuxième problème. En d'autres termes, il nous est interdit de faire les deux.
                'For this exam, we must solve SOIT the first SOIT the second problem. In other words, we are forbidden to solve both.'

These facts can easily be captured within a theory of exhaustivity effects in which they arise thanks to the presence of an exhaustivity operator in the LF of the relevant sentences. In the case of *soit_soit*, I assume that *soit_soit* occurs obligatorily under the scope of an exhaustivity operator (later this licensing condition will be refined):

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17 If *ou* is heavily stressed, the discourse in (26-a) improves significantly.

(27)   *soit_soit* must occur in the scope of an exhaustivity operator.

In the context of this paper, the exhaustivity operator *exh* can be defined as applying to a propositional expression S associated with a set of alternatives $ALT(S)$ (a set of propositions), and as returning the conjunction of S and of the negations of the members of $ALT(S)$ which are not entailed by S:[18]

(28) $\|exh(S)\| = \lambda w. \|S\|(w) = 1 \wedge (\forall \phi \in ALT(S), \phi(w) = 1 \rightarrow ([\![S]\!] \subseteq \phi))$

The licensing condition in (27) allows us to explain the following set of facts:

- That in a plain, unembedded context, *soit_soit* tends to trigger an obligatory exclusivity inference (cf. (20) and (21-b)). This follows from the fact that in such a case the exhaustivity operator gives rise to an exclusive reading for disjunction.

- That in universally quantified context, *soit_soit* is not necessarily interpreted as exclusive, but nevertheless obligatorily triggers an exhausitivity effect (cf. (22) and (23)). This follows from the fact that if the exhaustivity operator takes matrix scope, and if the only alternative used is the one obtained by replacing *soit_soit* with a conjunction, the resulting reading is not equivalent to what would arise from an exclusive construal of *soit_soit*.

- That in universally quantified contexts, and more specifically in the scope of necessity modals, *soit_soit can* be interpreted as exclusive. (cf. (25) and (26-b)). This follows from the fact that the exhaustivity operator can also be inserted under the scope a universal quantifier.[19]

4.2   Constraint regulating the distribution of *exh*

A well-known observation (since at least Horn 1972, Fauconnier 1975) is that exhaustive readings cannot normally arise when the relevant scalar item occurs in a DE context (see also Chierchia, Crain, Guasti, Gualmini & Meroni 2001, Crain 2008 for experimental confirmation of this old observation). In the traditional Gricean

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18 This version of the exhaustivity operator runs into problems when the set of alternatives contain 'symmetric' alternatives (following Fox's (2007a) terminology), i.e. alternatives which are not entailed by the prejacent of *exh* but are such that negating both together contradicts the prejacent. See Spector (2003), van Rooij & Schulz (2004), Fox (2007a) for refined versions of the exhaustivity operator that solve this problem, Sauerland (2004) for a related proposal, and Chierchia et al. (2012) for a survey. I adopt the more simple version of the exhaustivity operator for presentational purposes.

19 As a reviewer noted, this does not provide an explanation for the fact that embedded exhaustivity effects appear to be more accessible with *soit_soit* than with *ou*. I don't have any account for this fact.

approach, this follows directly from the fact that they arise as conversational impli-
catures, and that scalar implicature computation applies to full speech-acts, with the
result that embedded exhausitivity effects are impossible in *any* environment. Fur-
thermore, when the relevant scalar item is the lowest element of its scale, embedding
it in a DE-context results in a situation where the relevant alternatives (obtained by
replacing the scalar item with one of its scale-mates) are *weaker* than (i.e. entailed
by) the target sentence, with the effect that the scalar item in question cannot trigger
either a global scalar implicature.

Within the neo-Gricean framework, the distribution of *soit_soit* could thus follow
from a requirement that any occurrence of *soit_soit* must trigger an exhaustivity
effect and that its only alternative is conjunction.[20] Such a requirement would indeed
ensure that *soit_soit* cannot be embedded in a globally DE-environment. This is
essentially the hypothesis that Mouret (2007) briefly considers.

My proposal is based on the same intuition.[21] However, as discussed in Chierchia
et al. (2012), the very fact that, with certain scalar items, exhaustivity effects appear
to be *obligatory* is not expected from a purely Gricean point of view, in which
they arise as conversational implicatures. In the Gricean approach, conversational
implicatures are 'defeasible': since they are not part of the linguistic meaning of
the sentence but derive from general principles of conversational rationality, the
participants of a conversation are supposed not to derive them when it would be
irrational to do so. And in a case where an implicature is generated on line but later
turns out to create a contradiction with subsequent discourse, the Gricean approach
predicts that a rational interpreter will revise his initial understanding and 'remove'
the implicature. On the standard view, this is presumably what takes place in cases
of so-called 'cancellation', such as, e.g., (19) above (see also footnote 15). But
providing a purely Gricean account of the data reported in (20), or of the more
general fact that *soit_soit* is ruled out if it is in a position in which it cannot trigger
an exhaustivity effect, is at the very least not a trivial task. That is, if the exclusivity

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20 It is in fact dubious that conjunction is the only alternative induced by disjunction. Rather, as argued
by Sauerland (2004) and Spector (2003), a disjunctive phrase 'A or B' also has 'A' and 'B' as
alternatives. Once this assumption is made, we run into the problem of 'symmetric' alternatives
mentioned in footnote 18. Again, we ignore this complication for presentational purposes.

21 As noted by a reviewer, it is not entirely true that low scalar items cannot retain their strengthened
meaning in DE-context, specifically in the scope of negation. They can in certain contexts, if the
relevant scalar item is stressed. Such cases have been argued to invole a 'metalinguistic' use of
negation (cf. Horn 1985). We thus expect *soit_soit* to be acceptable under negation with prosodic
emphasis on *soit_soit*, in the type of contexts that allow for embedded exhaustive readings in the
scope of negation. Following the reviewer's intuitions for Italian *o ... o ...*, my impression is that
this prediction is borne out. That is, the following seems to me to be possible, especially in an echoïc
context (with stress on the first occurrence of *soit*): 'Jean ne parle pas SOIT allemand, soit anglais, il
parle allemand ET anglais' [Jean does not speak SOIT German soit English, he speaks German AND
English].

inference triggered by *soit_soit* were a pragmatic inference based on a reasoning about the speaker's communicative goals, we would expect this inference not to arise when a cooperative speaker could not rationally have intended to express it. If a potential contradiction is detected only *after* the sentence has been interpreted (for instance because subsequent discourse contradicts an exhaustivity inference that was derived), this should lead a rational interpreter to revise his initial understanding and reanalyze the sentence (so-called 'cancellation'). So the pragmatic Gricean approach has no straightforward way to account for cases where an exhaustivity effect appears to be obligatory (i.e. cannot be 'cancelled' through reanalysis in this way). In contrast with this, my proposal has no problem dealing with both types of cases (*ou* and *soit_soit*): the reason why (19) is a coherent discourse is that with *ou* exhaustification is optional (allowing for reanalysis of the first sentence if it was first understood in the exclusive sense), and the reason why (20) sounds incoherent is that *soit_soit* triggers obligatory exhaustification (and so reanalysis is not an option).

Within my framework, the unavailability of embedded exhaustivity in DE-environments has to be accounted for by a constraint regulating the distribution of the exhaustivity operator. Following Chierchia et al. (2012), I adopt the following constraint (see also Fox & Spector (2008)):

(29)   Economy Constraint on the distribution of *exh*: An occurrence of *exh* in a given sentence S is not licensed if eliminating this occurrence leads to a sentence S' such that S' entails S.

This rules out the occurrence of an exhaustivity operator in a DE-environment, since it would result in a globally weaker meaning than the meaning that would arise without it. Furthermore, applying an exhaustivity operator at matrix level, and associating it with a low scalar item that is itself embedded in a DE-environment, gives rise to a meaning that is equivalent to the one that would arise without the operator (hence would be entailed by it): as in the standard Gricean approach, the relevant alternatives are now entailed by the target sentence, with the result that no alternative can be negated.

4.3 Explaining the distribution of *soit_soit*.

The constraint in (29), together with the constraint that *soit_soit* be under the scope of an exhaustivity operator ((27)), predicts that *soit_soit* cannot occur in a globally DE-environment. Specifically, as we will see shortly, when *soit_soit* occurs in a globally DE-environment, it cannot be in the scope of *exh* without the sentence violating (29). Let me briefly show this.

Suppose *soit_soit* occurs in a globally DE-environment. Then *soit_soit* occurs within the scope of an odd number of DE-operators. The exhaustivity operator *exh*

either scopes over an even or an odd number of DE-operators. If, on the one hand, it scopes over an odd number of DE-operators (for instance if it is inserted at topmost level), its prejacent defines a DE-environment for *soit_soit* with the result that *exh* is vacuous (because the alternative obtained from the prejacent by replacing *soit_soit* with a conjunction is weaker than the prejacent). If, on the other hand, *exh* scopes over an even number of DE-operators, it must fall within the scope of an odd number of DE-operators, and therefore occurs in a DE-context. But, as discussed above, in such a case the presence of *exh weakens* the global meaning of the sentence, i.e. the reading that results from its presence is entailed by the reading that would have arisen in its absence. Hence (29) is once again violated.

4.4   Remaining issues: when exhaustification is vacuous and yet is licensed.

The account I am proposing faces two types of problematic cases. The first one (which is based on a remark by Orin Percus, p.c.) is illustrated by the following sentence:

(30)   Soit il pleut, soit il ne pleut pas.
        '*SOIT it is raining, SOIT it is not raining*'

Crucially, the exclusivity inference triggered by *soit_soit* is in this case a tautology, as it amounts to 'It is not both raining and not raining'. So applying *exh* here is vacuous, and thus violates the Economy Condition, and yet (30) is no worse than its counterpart with a simple disjunction.

A second problem has to do 'Hurford Disjunctions', which Chierchia et al. (2012) argue involve vacuous exhaustification of the first disjunct:[22]

(31)   John will either solve some of the problems or solve all of the problems

According to Chierchia et al. (2012), (31) is necessarily parsed as *John will either (exh(solve some of the problems)) or solve all of them*. But *exh* in this structure is vacuous.

While I will not provide here a complete solution to these problems, let me suggest a possible approach, which is based on joint, on-going work with Danny Fox (Fox & Spector 2008). Following ideas first put forward in Gajewski (2002) and subsequently elaborated in Fox & Hackl (2007), I would like to claim that the notion of logical entailment that is relevant to the Economy Condition is a non-standard one, which operates on very impoverished logical forms. More specifically, a structure S of the form $[_S \ldots exh(\phi) \ldots]$ will fail the economy condition just in case for every structure S', noted $[_{S'} \ldots exh(\phi') \ldots]$, which can be obtained from S by

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22 Thanks to Michael Franke for raising this specific question.

arbitrary *and non uniform* replacements of non-logical items with other non-logical items (allowing for cases where only one occurrence of a repeated item undergoes replacement), S' happens to be entailed by what results from eliminating *exh* in S'.

If such an approach is adopted, (30) no longer violates the Economy Condition. The reason is that by replacing the second occurrence of *pleut* by *vente* ('being windy'), we get a sentence for which exhaustification is no longer vacuous (and, in fact, strengthens the global meaning of the sentence). Likewise, (31) is no longer ruled out, because by replacing, say, the second occurrence of 'problems' with some other nouns, the exhaustivity operator on the first disjunct stops being vacuous. Of course, to make such an account viable, one must be very careful in determining what counts as a 'non-logical item', and make sure, in particular, that DE operators count as 'logical' (or at least that DEness is 'seen' by the grammar, and that the 'replacement' procedure mentioned above can only replace a DE-operator with a DE-operator).[23] Let me point out that an account along these lines predicts that (31) cannot be embedded in a DE-contexts, for in such a case the embedded exhaustivity operator cannot strengthen the overall meaning of the sentence even ignoring the identity of the non-logical vocabulary. Quite generally, Hurford Disjunctions are themselves expected to be global PPIs, in the sense that they should not be licensed in DE-contexts. Strikingly, this empirical claim has been recently defended by Gajewski & Sharvit (2012).[24] In joint work with Danny Fox, we argue for a version of such an approach, partly on the basis of Gajewski & Sharvit's (2012) observations.

5 Restrictors and factive intervention

As noted above, *soit_soit* is licensed in the restrictors of quantifiers and in the scope of negated factive verbs. In this section I show how my proposal can be extended to account for this.

5.1 Restrictors and scalar implicated presuppositions

I will argue that the apparent exceptions of restrictors are in fact compatible with my general approach approach. My main empirical claim is that the distribution of *soit_soit* obeys the following generalization:

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23 And since it is also necessary to count at least some scalar items as 'logical', the treatment of a Hurford Disjunction such as 'John solved some or all of the problems' will have to assume a more complex underlying structure in which either the verb 'solved' or the noun 'problems' occurs twice - not an implausible assumption given that such a sentence presumably has a parse involving right-node raising.

24 Gajewski & Sharvit (2012) however do not predict a factive intervention effect for Hurford Disjunctions.

(32)   *soit_soit* is licensed only if it occurs in a position in which a low scalar item can trigger a scalar inference.

Now, it turns out that universal quantifiers do not fully behave like run-of-the-mill DE-environments, because a low scalar item occurring in such a restrictor triggers what I will call a *scalar implicated presupposition*. To see this, consider the following sentence:

(33)   Every student of mine who solved either the first or the second problem got a good grade.

Disjunction in (33) is interpreted as inclusive, since the whole sentence is understood to imply that I gave a good grade not only to students who solved just one of the two problems, but also to those who solved both.[25] This is expected given that disjunction occurs in the restrictor of *every*, hence in a DE-context. Note, however, that (33) also licenses the following inference:

(34)   Some students of mine solved the first or the second problem but not both.

Indeed, if every student of mine who solved the first or the second problem (in the inclusive sense) happened to have solved both problems, I would presumably have said (35) rather than (33):

(35)   Every student of mine who solved the first and the second problem got a good grade.

Consider also the following example:

(36)   Every student of mine who solved some of the difficult problems got a good grade

(36) entails that every student of mine who solved *all* problems got a good grade, which shows that *some* is not interpreted as equivalent to *some but not all*. But (36) triggers the inference that some students of mine solved some but not all of the difficult problems – had I known that every student of mine who solved at least some of the difficult problems in fact had solved them all, I would have rather used the definite description *the difficult problems*, or maybe *all of the difficult problems*.

These inferences can be viewed as *implicated presuppositions* (Sauerland 2008) triggered by the relevant scalar item (disjunction in the case of (33), *some* in the case

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25 This does not exclude in principle that an exclusive construal might be possible as well. In the above example, given our expectations regarding the relationship between solving problems and getting a good grade, an inclusive construal would be preferred even if the sentence were in fact ambiguous between an inclusive and an exclusive construal. See the discussion a few pages below.

of (36)), due to a principle known as *Maximize presupposition!* (Heim 1991, Sauerland 2008). More specifically, they are expected given the following assumptions:

(37)   a.   *Maximize Presupposition!*
       (i)   Contextual Equivalence (auxiliary definition): two sentences are *contextually equivalent* if and only if they have the same truth value in every world compatible with the common ground.
       (ii)   If two sentences S_1 and S_2 are alternatives of each other and are *contextually equivalent*, and if S_1's presuppositions asymmetrically entail S_2's presupposition, then pick S_1 rather than S_2.
       b.   Scalar alternatives are relevant to the application of *Maximize Presupposition!*.[26]
       c.   *Aristotelian quantifiers*: Non-existential quantifiers presuppose that their restrictors have a non-empty denotation.

Consider again, e.g., (36). According to (37-b), *Maximize Presupposition!* applies to (36) on the assumption that it competes with (38):

(38)   Every student of mine who solved all of the difficult problems got a good grade

Given (37-c), (38) presupposes that some students of mine solved all of the difficult problems, while (36) presupposes only that some students of mine solved at least some of the problems. Since the presuppositions of (38) entail that of (36), an utterance of (36) cannot be felicitous in a context which makes it equivalent to (38) (by (37-a)). But if context entailed that no student of mine solved some but not all of the difficult problems, then (36) and (38) would be contextually equivalent (since in such a case both restrictors would have the same denotation in every world of the common ground). An utterance of (36) is thus felicitous only in contexts which do *not* entail that no student of mine solved some but not all of the difficult problems. In other words, (36) triggers the implicated presupposition that *possibly* some students of mine solved some but not all of the problems. This anti-presupposition can in some contexts be strengthened into 'some students of mine solved some but not all of the problems', if for instance it is assumed that I know which problems my students solved (see Chemla 2008 for an explicit account of this strengthening process). By a similar reasoning, one derives that (33) triggers the implicated presupposition that

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26 The standard cases which motivated *Maximize Presupposition* in the first place (Heim 1991) involved a competition between a presupposition trigger and a non-presuppositional alternative expression. For instance, the oddness of *A prime minister of the United Kingdom is bald* is supposed to result from a competition between this sentence and *The prime minister of the United Kingdom is bald*.

possibly some students of mine solved the first or the second problem but not both (which can be strenghtened into 'some students of mine solved the first or the second problem but not both).

Going back to *soit_soit*, we can now explain the fact that it is felicitous in the restrictors of quantifiers by relating it to the existence of these implicated presuppositions – presuppositions of the form 'common knowledge does not entail that ϕ', i.e. 'possibly $\neg\phi$'. The principle regulating the distribution of *soit_soit* should now be stated in the following way:[27]

(39)   *soit_soit* is felicitous only if it is under the scope of an exhaustivity operator or gives rise to a scalar implicated presupposition.

At this point, let me note that this treatment of strengthened presuppositions triggered by scalar items in restrictors gives rise to a theoretical complication. Namely, the restrictors of universal and negative quantifier no longer qualify as monotone-decreasing environments. More specifically, the restrictor of a universal or a negative quantifier now defines a *Strawson-decreasing* environment, but not a decreasing-environment. Informally, this means that such environments are monotone-decreasing relative to the assertive content, but not monotone-decreasing once presuppositions are taken into account.[28] This has an important consequence: unless we modify our Economy Condition, we now predict *exh* to be able to occur within the restrictor of such quantifiers, and, more generally, within Strawson-decreasing environments which are not strictly decreasing. This is so because an embedded *exh* in such cases weakens the assertive level of the sentence, but at the same time *strengthens* the non-vacuity presupposition associated with restrictors, as illustrated in (40):

(40)   Every student who$_i$ *exh*(t$_i$ solved the first or the second problem) got a good grade
         ⤳ *Asserts* that every student who solved just one of the two problems got a good grade, with no implication regarding those who solved both (assertion is weakened by the presence of *exh*)

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27 It is possible to formally define an alternative-sensitive 'Maximize Presupposition'-operator which adds to its prejacent its implicated presuppositions. As discussed in Singh (2011), Percus (2006) provides evidence that *Maximize Presupposition!* must be able to apply *locally*, which may motivate the introduction of such an operator. Then the licensing condition in (39) could be reformulated as saying that *soit_soit* is licensed only under the scope of *exh* or that of the 'Maximize Presupposition'-operator.

28 More formally, a function f from propositions to propositions is Strawson-decreasing if the following holds : for any two (bivalent) propositions ϕ and ψ such that ϕ entails ψ, for every world w such that both $f(\phi)(w) \neq \#$ and $f(\psi)(w) \neq \#$, if $f(\psi)(w) = 1$, then $f(\phi)(w) = 1$. This definition can easily be generalized to functions applying to the denotations of expressions which have a non-propositional type ending in t.

⤳ *Presupposes* that there is at least one student who solved the first or the second problem but not both (presupposition is strengthened by the presence of *exh*)

The important point is that a sentence such as (40) fails to be entailed, in the strict sense, by the proposition that would be expressed if *exh* were absent. For in worlds in which no student solved just one of the two problems but every student who solved both problems got a good grade, the variant without *exh* is true while (40) is neither true not false. Hence, (40) meets the condition stated in (29). Is the prediction that (40) is licensed correct? In other terms, are embedded exhaustive readings possible in restrictors of negative and universal quantifiers? Such a possibility seems to be at odds with the standard view that embedded exhaustification is generally impossible in DE contexts. However, some of the recent literature argues that embedded exhaustification is possible in the restrictors of universal quantifiers (see in particular Crnič 2013).[29]

While this somewhat unconventional prediction should be tested by experimental methods (which to my knowledge has not been done), I do not want to commit myself to the claim that such embedded exhaustivity effects are readily available. It is possible to modify the Economy Condition so as to rule out *exh* in all Strawson-decreasing environments, but the choice between the various conceivable versions of the Economy Condition is not a major concern of this paper as long as it does not affect the predictions regarding the distribution of global PPIs.[30] What is important from the point of view of this paper is the fact that sentences like (33) clearly trigger scalar implicated presuppositions. Given the generalization proposed in (39), this is sufficient to account for the acceptability of *soit_soit* in such environments.

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29 I do not discuss if-clauses, which seem to license embedded exhaustification quite easily (cf. Levinson 2000) . Since if-clauses can be viewed as restrictors of universal quantifiers over possible worlds, the approach discussed here can be straightforwardly extended to them.

30 To rule out structures such as (40), one option is to strengthen the condition regulating the distribution of *exh* stated in (29). Instead of requiring only that an occurrence of *exh* does not *weaken* the meaning of the sentence (i.e. does not make the sentence entailed by its variant without the occurrence of *exh*), we might even require that an occurrence of *exh* in a sentence *S* have a *strengthening* effect (i.e. *S* should a-symmetrically entail the reading that would result if *exh* were absent). Such a constraint would rule out *exh* not only in monotone decreasing environments, but also in non-monotonic ones. In fact, the restrictor of a universal quantifier, given the non-vacuity presupposition associated with it, turns out to be non-monotonic in the strict sense. This consequence might be problematic in light of experimental evidence that embedded exhaustive readings are available in at least some non-monotonic contexts (cf. Chemla & Spector 2011, but see also Geurts & van Tiel 2013 for a criticism of Chemla & Spector's conclusions). A possible refinement would consist in distinguishing contexts which are non-monotonic due to their assertive content alone and contexts which are non-monotonic in the strict sense but nevertheless *Strawson-decreasing* (Von Fintel 1999). Some aspects of the behavior of *almost*, discussed in section 6.3, are relevant to this issue.

5.2 Factive intervention

As noted above, factive verbs are able to rescue *soit_soit* under the scope of negation:

(41)   a. *Jacques n'est pas certain que Marie étudie soit l'italien soit l'anglais.
          'Jacques is not sure that Mary studies soit Italian soit English'
    b. ok Jacques ne sait pas que Marie étudie soit l'italien soit l'anglais.
          'Jacques does not know that Mary studies SOIT Italian SOIT English'

This contrast is again expected given our approach, because, as has been observed by Sharvit & Gajewski (2007), when the CP complement of a negated factive verb contains a low scalar item, the resulting presupposition that the embedded clause is true tends to be enriched with the scalar inference that the clause would trigger in isolation:

(42)   Mary doesn't know that Peter solved the first or the second problem
    ⤳ Peter solved one of the two problems but not both

Since a low scalar item in such a configuration can trigger a scalar inference, we expect *soit_soit* to be possible in such a configuration, and to obligatorily trigger the corresponding scalar inference. And it is indeed the case that (41-b) is perceived as entailing that Marie studies either Italian or English but not both.

While the phenomenon of 'presupposition strengthening' observed in connection with (42) is reminiscent of that of implicated presuppositions discussed in section 5.1, it turns out, on closer examination, that it cannot be derived by the same mechanism. More specifically, the consequences of the *Maximize Presupposition* principle are too weak to ensure that (42) is necessarily infelicitous if in fact it is common knowledge that Peter solved both the first and the second problems. Let us see why.

Assume that (42) has been uttered. What *Maximize Presupposition* tells us is that (42) cannot be contextually equivalent to its competitor in (43) (since (43)'s presuppositions logically entail those of (42) (cf. (37)).

(43)   Mary doesn't know that Peter solved both the first and the second problems.

What I am going to show is that there exists a context where a) it is common knowledge between the participants of the conversation that Peter solved both the first and the second problems, and b) nevertheless (42) and (43) are not contextually equivalent. In such a context (42) can be uttered without there being any violation of *Maximize presupposition!*. This is sufficient to show that *Maximize Presupposition!* does not by itself predict (42) to be infelicitous if common knowledge entails that Peter solved both problems. Here is a characterization of such a hypothetical context. First, it is a context where Mary is not herself a participant of the conversational

exchange (i.e. her beliefs play no role in determining the 'common ground'). Second the set of worlds compatible with the common ground (i.e. what is common knowledge between the participants of the conversational exchange) have the two following properties:

i. All the worlds compatible with the common ground are worlds where Peter solved both problems.

ii. These worlds divide into two types: worlds $W1$ in which Mary knows that Peter solved Problem 1 or Problem 2 **but does not know that he solved both**, and worlds $W2$ in which Mary believes (wrongly) that Peter didn't solve any problem at all.

Now, in worlds of type $W1$, (42) is false, but (43) is true. In worlds of type $W2$, both (42) and (43) are true. Hence (42) and (43) are not contextually equivalent in such a context (i.e. don't have the same truth-value across all the worlds compatible with the common ground), and thus it should be possible for a participant of the conversational exchange to utter (42) without violating *Maximize Presupposition!* (and such an utterrace would in fact tell the participants that the actual world is a world of type $W2$ rather than $W1$). But note that in this context it is common knowledge that Peter solved both problems.

The phenomenon of presupposition strengthening in the case of factive verbs and that of implicated presuppositions thus raise a non-trivial unification problem, which I will not attempt to solve in the context of this paper. The important point, in the context of this paper, is that *soit_soit* is licensed under the scope of negation precisely in contexts which give rise to presupposition strengthening. Given our specific implementation, what we need to assume in order to make this prediction is that the exhaustivity operator is also responsible for these strengthened presuppositions. One possible way to achieve this is to stipulate that, in the case of factive verbs, *exh* treats the factive presupposition on a par with the asserted content. In the case of (42), the exhaustivity operator would then apply to the proposition expressed in (44-a) , whose alternative is given in (44-b)

(44)   a.   Peter solved the first or the second problem and Mary does not know that Peter solved the first or the second problem
        b.   Peter solved the first and the second problem, and Mary does not know that Peter solved the first and the second problem

Let us represent 'Peter solved the first problem' as F, 'Peter solved the second problem' as S, and let us use the notation $K\phi$ for 'ϕ is true in every world compatible with Mary's knowledge'. Applying *exh* to (42) thus results in the following:

(45) $(F \vee S) \wedge \neg K(F \vee S) \wedge \neg[(F \wedge S) \wedge \neg K(F \wedge S)]$

Now, (45) entails $\neg K(F \vee S)$, which in turn entails $\neg K(F \wedge S)$ (because K is a monotone increasing operator). So the only way in which the second big conjunct $(\neg[(F \wedge S) \wedge \neg K(F \wedge S)])$ can be true is if $F \wedge S$ is false. (45) is thus equivalent to (46), which is the desired result:

(46) $(F \vee S) \wedge \neg(F \wedge S) \wedge \neg K(F \vee S)$
         = Peter solved the first or the second problem but not both, and Mary does not know that Peter solved the first or the second problem.

6   Another global PPI : *almost*

English *almost* appears to be a global PPI. It is anti-licensed both by a clause-mate negation and by negation across a CP boundary, as the data in (47) and (48) illustrate (all the contrasts reported in this section were tested in an on-line questionnaire, as discussed in the appendix - I often use '??' rather than '*' because the contrasts were a little bit less sharp in the case of *almost* than with *soit_soit*.).

(47)   [Anti-licensing by a clause-mate negation]
         a.   Mary solved all of the problems on time.
         b.   Mary didn't solve all of the problems on time.
         c.   Mary solved almost all of the problems on time.
         d.   ?? Mary didn't solve almost all of the problems on time.

(48)   [Long-distance anti-licensing]
         a.   I think that Mary solved all of the problems on time.
         b.   I don't think that Mary solved all of the problems on time.
         c.   I think that Mary solved almost all of the problems on time.
         d.   ?? I don't think that Mary solved almost all of the problems on time.

Almost is also anti-licensed by a DE indefinite such as *few*:

(49)   a.   Mary countries are close to having full nuclear capacity.
         b.   Few countries are close to having full nuclear capacity.
         c.   Many countries almost have full nuclear capacity.
         d.   ?? Few countries almost have full nuclear capacity.

While these examples show that *almost* a) passes the test of long-distance anti-licensing, and b) is anti-licensed in DE contexts quite generally, the following data suggest that, like other PPIs, it can be rescued under the scope of an anti-licenser when this anti-licenser is itself in the scope of a negative element (as reported in the

appendix – B.3.2 –, this contrast in my survey was quite weak compared to some others, but was statistically significant, and so was the expected interaction between the two relevant factors, i.e. 'simple vs. double negation' and '*all* vs. *almost all*'):

(50)   a.   I left the party without having told all of the guests that I was leaving

        b.   ?? I left the party without having told almost all of the guests that I was leaving

        c.   I never leave a party without having told all of the guests that I am leaving

        d.   (?) I never leave a party without having told almost all of the guests that I am leaving

Just like *soit_soit*, *almost* is fine in restrictors ((51)), and is also fine in the scope of negation if a factive verb intervenes. The sentences in (52) illustrate that *almost* is fine under 'neg+*know*', but not under 'neg+*think*', and that removing the *almost* destroys the contrast.

(51)   Every student who has almost finished will go out tonight

(52)   a.   Lisa informed her parents that she did very well at the exam, but they don't know that she solved almost all of the problems.

        b.   ?? Lisa informed her parents that she did very well at the exam, but they don't think that she solved almost all of the problems.

        c.   Lisa informed her parents that she did very well at the exam, but they don't know that she solved all of the problems

        d.   Lisa informed her parents that she did very well at the exam, but they don't think that she solved all of the problems

In the next section, I will show that *almost* can receive an analysis which is very similar to the one that has just been developed for *soit_soit*. Namely, a lot of puzzling facts about the interpretation of *almost* can be made intelligible if we assume that it is required to occur under the scope of an exhaustivity operator.

6.1 *Almost* **and negative** *implicata*

At first sight, a sentence such as (53) has quite straightforward truth-conditions. It is true if Mary's exact age is close to 18 but is strictly smaller than 18:

(53)   Mary is almost 18 years old.

Likewise, (54) implies that Mary has not finished yet, but that she will soon have.

(54)   Marie has almost finished

⤳Marie has not finished

So *almost*, as a rule, seems to trigger the following inference (among others):

(55)   Almost $\phi \rightsquigarrow \neg \phi$

In the literature, this inference has been described as a) obligatory, and b) different from a standard implication (Jayez & Tovena (2008), Nouwen (2006)) in various ways. For instance, as observed in Jayez & Tovena (2008) for French *presque*, there is an interesting contrast between the two following dialogues:

(56)   a.   Is Mary young?
         b.   Absolutely! She is about to turn 7.

(57)   a.   Is Mary young ?
         b.   #Absolutely! She is almost 7.

What this contrast shows is that, even though 'she is almost 7' implies that Mary is younger than 7 years-old, this implication cannot be used to argue that Mary is young, in contrast with what we see with 'she is about to turn 7'. This suggests that, in some intuitive sense, this implication is not part of the 'main point' of the utterrance. Jayez & Tovena (2008) argue, convincingly in our view, that this implication is not a presupposition.[31]

Another striking fact about this inference is that it does not seem to be *always* attached to the meaning of the relevant sentences when these sentences are embedded. Nouwen (2006), for instance, discusses the following example:

(58)   If you want to pass the exam, you have to answer almost all questions correctly.

Nouwen notes that (58) does not mean that if you want to pass the exam, your obligation is to pass almost all but not all of the questions, which would entail that you *fail* the exam if you solve all questions. Rather, it means that in order to pass, you have to answer at least almost all the questions, and you don't have to answer all of them. Now, in this specific case, one might argue that *almost* is interpreted as scoping above the modal *have* (yielding 'You almost have to answer all questions, but you don't have to answer all questions). But an analysis of this type cannot be extended to the following case:

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31 Note for instance that sentences with *almost* fail the *wait a minute !* test:

(i)   a.   Mary is almost 7
        b.   #Wait a minute! I didn't know she was not 7 yet

(59)   [Context: On some days, John does not do even half of his homework. On
       other days, he finishes his homework. Quite often, he does most of his
       homework, but not all it. His parents are not terribly demanding, and they
       sometimes take him to the movies even when he has not completely finished
       his homework. Nevertheless . . .]
       They never take him to the movies unless he has almost finished his home-
       work.

The point here is, again, that (59) is not interpreted in this context as implying that
John's parents never take him to the movies when he has completely finished his
homework. Rather, it means that they never take him to the movies unless he has *at
least* almost finished.

Based on similar considerations, Sadock (1981) argued that the negative implica-
tion triggered by *almost* is a conversational implicature, akin to a scalar implicature.
Penka (2006) and Nouwen (2006) rebut this claim, on the basis of the following ar-
gument: if this negative implication were a conversational implicature, then it should
be 'defeasible', 'cancellable', i.e. not be obligatory. I concur with this argument, and
agree that the observed negative implication cannot be a conversational implicature
in Grice's sense. However, within the grammatical approach to scalar inference,
this does not exclude that the negative implications trigerred by *almost* could be an
obligatory exhaustivity effect. Obligatory scalar inferences are not expected if scalar
inferences are conversational implicatures, but they are not particularly problematic
if they arise by means of an exhaustivity operator – since in some cases the operator
could be obligatory.

6.2   *Almost* and obligatory exhaustification

The facts we have just reviewed can be accounted for by assuming that the negative
implication triggered by *almost* is not part of its lexical meaning, but comes about
as an obligatory scalar inference, due to a requirement that *almost* be under the
scope of an exhaustivity operator. When *almost* is sufficiently embedded, there are
multiple choices as to the insertion site of the exhaustivity operator. When some
other operator intervenes between the exhaustivity operator and *almost*, the negative
implication is computed at the level of the exhaustivity operator, so that the negative
implication which is associated with *almost* ϕ in isolation does not necessarily
survive when *almost* ϕ is embedded. Let us explain more precisely how such a story
could work. To get going, we need to make some specific assumptions about the
meaning of *almost*.[32]

_____

32 These assumptions are clearly too simplistic, if only because *almost* does not only modify degree
   predicates. They are sufficient for our purposes. See Nouwen (2006) for a comparison of various

(60)   a.   Let ϕ be a degree predicate. Then *almost* $\phi(d)$ is true if there is a degree d' which is very close to d on the relevant scale such that $\phi(d')$ (a more formal implementation would have to make use of a contextual parameter in terms of which the relevant notion of closeness would be defined).

   b. $\phi(d)$ is an alternative to *almost* $\phi(d)$

   c.   *almost* $\phi(d)$ has to occur under the scope of an exhaustivity operator which is associated (in the sense of 'association with focus') with it. The alternatives for this exhaustivity operator thus have to be the ones generated by *almost* $\phi(d)$.

Let us start with *John is almost 21 years old*. We assume that the degree predicate *old* is downward-monotonic relative to its degree argument, i.e. for any d, d' such that $d < d'$, being d'-old entails being d-old – one is d-old if and only if one's age is d or more. Given (60), *John is almost 21 years old* must have the following representation:

(61)   exh(almost [John is 21 years- old])

This is predicted to mean the following

(62)   For some d very close to 21 years, John is d-old, and John is not 21 years-old.

Given the assumption that *old* is downard-monotonic relative to its degree argument, we have to choose a d that is strictly smaller than 21 years. For any d equal to or greater than 21 years, (62) would be a contradiction. So the result we get is that John's exact age is smaller than but very close to 21 years old, which is clearly correct.[33]

For cases where there is no overt degree expression, as in *John has almost finished* or *the bottle is almost empty*, we assume, that the relevant predicate (*finished* or *empty*) is a degree predicate whose degree argument is filled with the maximal element of its scale, call it *max* (following Kennedy's 2007 assumption regarding predicates whose scale has an upper-bound).[34] The relevant representation for *John*

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proposals for *almost*, and the literature cited therein. See also Penka (2006).

33 With such a semantics, we also capture Nouwen's (2006) observation that when *almost* modifies a non-monotonic degree predicate, as in *John is almost exactly 21-years old*, then there is no implication that John is younger than 21 years old, but only that his age is close to 21 years old. Our informal proposal captures this fact, both if we assume that *almost* modifies *exactly* and if we assume that it modifies *exactly 21 years old*.

34 It is well known that *almost* cannot easily modify a degree predicate whose scale does not have an end-point, such as *tall*. Cf. Kennedy (2007) and Rotstein & Winter (2004)

has almost finished is thus the following:

(63)   exh(almost[John has *max*-finished])

This is predicted to mean the following, which is, again, an intuitively correct result:

(64)   For some *d* close to *max*, John has *d*-finished, and it is not the case that John has *max*-finished.

Let us now look at cases where *almost* occurs under the scope of various operators, as in (65):

(65)   You can go to the movies only if you have almost finished your homework

A possible representation for (65), given our assumptions, is the following:

(66)   exh (you can go to the movies only if you have almost finished your homework)

Ignoring the contribution of *exh*, (66) means that you can go to the movies only if you have at least almost finished your homework. What *exh* does consists in adding to this the negation of *you can go to the movies only if you have finished your homework*. So the resulting meaning has to entail that you don't have to have completely finished your homework in order to go to the movies. This is a correct result: (65) conveys that it is necessary for you to have *at least* almost finished your homework, but that it is not necessary for you to have completely finished.

The cases discussed in by Nouwen work in a completely similar way. Consider for instance (58), repeated below as (67):

(67)   (If you want to pass the exam,) you have to answer almost all questions correctly.

Under the representation given in (68), (67) is predicted to mean that in order to pass the exam, the numer of questions you answer correctly has to be very close to the total number of questions, but does not have to be equal to that number.[35]

(68)   exh(you have to answer almost all questions correctly).

Looking at cases involving factive intervention, it is interesting to note that the negative *implicatum* normally triggered by *almost* tends not to contribute to the asserted content, but only to the factive presupposition itself. Thus consider the following.

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35 As noted above, our toy semantics for *almost* does not allow it to modify a non-scalar predicate, hence cannot handle this case. See Penka (2006) for a more realistic semantics for *almost*.

(69)   Mary does not know that Peter has almost finished.

Clearly, (69) triggers the inference that Peter has almost finished but not quite. However, it does not seem to mean that what Mary does not know is the fact that Peter has almost finished but not quite. For suppose that Mary, in fact, erroneously believes that Peter has completely finished, based on some conclusive evidence. Then it is far from clear that (69) can be said to be true. The reading that seems to be the most salient is thus one in which (69) presupposes that Peter has almost finished but not quite and asserts that Mary does not know that Peter has *at least* almost finished. This is fully expected within our approach, given the way scalar inferences generally 'project' in such contexts (cf. section 5.2).[36]

Now, if negation is removed, then the negative implicatum *can* be part of the content that is attributed to the attitude holder, as in the following example:

(70)   Mary knows that Peter has almost finished.

(70) can easily be understood has implying that Mary knows both that Peter is not far from having finished that he has not completely finished yet. One could for instance object to (70) by saying "No! Mary does not know that Peter has not completely finished". On our view, this reading results from the availability of the following structure.

(71)   Mary knows that [exh(Peter has almost finished)]

On the other hand, we also predict the possibility of the following structure.

(72)   exh[Mary knows that Peter has almost finished]

Given the assumption that factive presuppositions get strengthened by the exhaustivity operator as if they were part of the asserted content, the meaning of (72) is the following:

(73)   Mary's knowledge entails that Peter has reached a degree of completion close to the maximal degree, Mary's knowledge does not entail that Peter has completely finished, and in fact Peter has reached a degree a completion close to the maximal degree but has not completely finished.

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36 Cf. related remarks in Nouwen (2006). This pattern would not be expected if the negative *implicatum* triggered by *almost* were a presupposition. Indeed, when a sentence ϕ presupposing p is embedded under *X (doesn't) know that* ..., the resulting sentence normally presupposes that the referent of *X* knows p. For instance, 'Mary does not know that Peter stopped smoking' pressuposes that Peter used to smoke and that Mary knows this (but doesn't know that he stopped being one).

While (73) is false if Mary erroneously believes that Peter has completely finished, it is however compatible with a situation where Mary knows that Peter is close to having finished and has no opinion as to whether Peter in fact has finished. This reading is therefore weaker than the one corresponding to (71), in that it does not entail that Mary knows that Peter has not completely finished, but only that she does not have the belief that Peter has completely finished (which allows for situation where she is simply not sure). The felicity of the following discourse suggests that this weaker reading also exists.[37]

(74)   Mary knows that Peter has almost finished, but she doesn't know that he hasn't completely finished.

6.3   Predicting the distribution of *almost*

If, as we assume, *almost* is specified as necessarily occuring in the scope of an exhaustivity operator, its distribution is straightforwardly explained, in exactly the same way as that of *soit_soit* is. It cannot occur in pure DE-contexts, because in such a case, applying *exh* in a position that c-commands *almost* would either result in a sentence that is strictly weaker than the sentence without *exh*, or be vacuous, as explained in section 4.3. In cases involving factive intervention, as we have just seen, the presence of *almost* is able to add a negative *implicatum* to the presupposition of the relevant sentences, which is why it can occur in the scope of an exhaustivity operator without our Economy Constraint being violated. Finally, we have just seen in connection with example (70) that in upward-entailing contexts, there are in principle several possible insertion sites for *exh*, with the result that quite subtle ambiguities are predicted.

What about restrictors? Consider the following example:

(75)   All the students who have almost finished their homework will go out tonight.

Similarly to our discussion in section 5.1, we expect that this sentence can be construed as asserting that all the students who have almost or completely finished their homework will go out tonight, and as triggering the implicated presupposition that there are students of mine who have almost finished their homework without having completely finished. This construal corresponds to what results from applying *Maximize Presupposition!*, which enriches the sentence with a scalar implicated presupposition and thus licenses *almost*, which is why (75) is not ruled out.

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37 Of course, an objection such as "No! Mary does not know that Peter has not completely finished" is not expected to be possible under this construal. The fact that this objection is felicitous has to be attributed to the availability of the reading corresponding to (71).

But, as we also discussed, depending on how exactly our Economy Condition is formulated (cf. section 5.1), we do not necessarily exclude another construal, in which the exhaustivity operator is inserted in the restrictor of the universal quantifier, just above *almost*. Under this construal, (75) is interpreted as "All the students who have almost finished their homework but not quite will go out tonight". To the extent that this reading is also available, it provides an argument for the first version of our Economy Condition ((29)) – rather than the modified version discussed in footnote 30.

7 Other Global PPIs: 'Class B' modifiers

French includes a number of positive polarity items for which an account along the same lines seems very plausible. For instance, the determiner *quelques* (approximately 'a few'), and the expression *un peu* ('a little'), which can function both as a determiner with mass nouns and as an adverb, which are very clearly positive polarity items, display a similar behavior as *soit_soit*. According to all my informants, they are degraded in globally monotone-decreasing environments and rescued in similar configurations as *soit_soit*(doubly negative environments, restrictors, negated factive verbs). Furthermore, they both give rise to strong scalar inferences (both *quelques* and *a few* trigger a 'not many' inference in unembedded contexts). For such items, thus, the proposal I have developed for *soit_soit* and *almost* can be extended straightforwardly.

However, there is another class of items which qualify as global PPIs but cannot be treated in the same way as *soit_soit*, *almost*, *quelques* or *ou*. This class includes modifiers such as *at least* or *approximately*, which Nouwen (2010) calls 'Class B modifiers'. I briefly address this class in the next sections.

7.1 *At least*

At least is generally infelicitous in the immediate scope of negation, suggesting that it is a PPI.

(76)   a.   ?? Mary didn't solve at least three problems
        b.   ?? Mary left without having talked to at least two people
              (Under the intended narrow-scope reading: 'Mary left and she talked to no more than one person')

The following facts illustrate that *at least* is a *global* PPI.

- Long-distance anti-licensing

(77)   a.   ?? Few people believe that Mary is at least 20 years old

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        b.   ?? John doesn't think Mary is at least 20 years old

        c.   ?? Jack bought cigarettes even though he is not at least 18 years old

As we expect, for every sentence in (77), replacing 'at least' with 'more than' removes any feeling of infelicity:

(78)   a.   Few people believe that Mary is more than 20 years old

        b.   John doesn't think Mary is more than 20 years old

        c.   Jack bought cigarettes even though he is not more than 18 years old

Note that *At least* is bad in DE-environments also when it does not modify a degree expression.

(79)   a.   ?? Few people think that Mary saw at least Peter

        b.   ?? I left without having talked to at least Peter

        c.   ?? I left politics without having been at least a mayor

- Rescuing by additional DE-operators

(80)   a.   I would never have left without having talked to at least Peter

        b.   No politician leaves politics without having been at least a mayor

        c.   Nobody doubts that Mary is at least 20 years old.

- Rescuing by a factive verb

(81)   a.   [Context: Speaker and addressee know that Mary is more than 20 years old but don't know her precise age]

             John doesn't know that Mary is at least 20 years old

        b.   [Context: Speaker and addressee know that Mary met Peter yesterday and don't know whether he met anybody else]

             Apart from us, few people know that Mary met at least Peter yesterday.

Now, in the case of *at least*, an account in terms of obligatory exhaustification does not seem to be available. If anything, in unembedded contexts, what *at least* does is that it *prevents* an exhaustivity effect from arising. That is, while a sentence such as 'John saw Peter', in certain contexts, triggers the inference that John didn't see anybody besides Peter, the sentence 'John saw at least Peter' strongly suggests that the speaker considers that it is possible that John saw someone besides Peter.

Nevertheless, I will argue that the distribution of *at least* is related to that of the exhaustivity operator. An interesting generalization (first discussed in Fox 2004) regarding *at least* is the following:

(82)   A sentence S of the form $[_S \ldots$ at least $(\phi) \ldots]$ sounds natural only if the sentence S' that results from deleting *at least* in S can give rise to an exhaustivity effect triggered by some material contained in ϕ.

At first sight, this could just appear to be a complicated way of stating that *at least* cannot occur in DE-environments (since this seems to be a constraint on *exh*), in which case it would not tell us anything more than the fact that *at least* is a global PPI. However, it turns out that the generalization in (82) makes predictions regarding the distribution of *at least* also in upward-entailing (UE) contexts. As was noted by Fox & Hackl (2007) (see also Fox 2007b, Chierchia, Fox & Spector 2009, Chierchia et al. 2012), there are expressions which do not trigger exhaustivity effects when they occur unembedded, except if specific contextual information is present, but do once they occur in the scope of a necessity modal. Such expressions include modified numerals of the form *more than n*. Now, a prediction of (82) is that *at least* can take scope over *more than n* and associate with it (*at least* is quite clearly a focus-sensitive element) exactly in contexts and syntactic environments where *more than n* triggers a scalar inference.

Let us introduce the relevant facts. Consider (83).

(83)   John solved more than five problems

As an answer to 'How many problems did John solve yesterday?', (83) does not trigger the inference that John didn't solve more than six problems (in which case it would end up conveying that John solved exactly six problems). In contrast with this, there are contexts where (83) does trigger an upper-bounded reading, e.g. contexts in which it is understood that students are categorized into groups based on the number of problems they solved. To make this clear, consider the following:

(84)   *Context: Grades are attributed on the basis of the number of problems solved. People who solve between 1 and 5 problems get a C. People who solve more than 5 problems but fewer than 9 problems get a B, and people who solve 9 problems or more get an A.*

        John solved more than five problems. Peter solved more than nine.

In this context, the sentence 'John solved more than 5 problems' can easily be intepreted as meaning that John solved more than 5 but fewer than 9, so that he will get a B.

Now, the crucial observation (cf. (85) and (86) below) is that in the first case (where the relevant sentence is uttered in a context where we are interested in the precise number of problems that John solved), *at least* cannot modify *more than five*, while it can in the second case, as expected given the generalization (82)

(85)   a.   How many problems did John solve yesterday?
        b.   #John solved at least more than five problems.

(86)   *Context: Grades are attributed on the basis of the number of problems*

> *solved. People who solve between 1 and 5 problems get a C. People who solve more than 5 problems but fewer than 9 problems get a B, and people who solve 9 problems or more will get an A.*

> John solved at least more than five problems. He will therefore get an A or a B.

A second important observation is that while *more than n* does not trigger a scalar inference when it occurs unembedded, except in contexts such as the ones in (84), it does very easily when embedded under a necessity modal. That is, (87) below, uttered as an answer to 'How many problems John is required to solve, minimally', implicates that John is not required to solve more than six problems:

(87)   John is required to solve more than five problems
        ⤳ John doesn't have to solve more than six problems

Now, the generalization in (82) leads us to expect that *at least* can be inserted in (87) in a position where it scopes over the modal and associates with *more than n*. This prediction is borne out:

(88)   John is at least required to solve more than FIVE problems (I don't know exactly).

Note that *at least* can also be inserted in a position lower than the modal, but where it can presumably be interpreted as taking scope over it:

(89)   John is required to solve at least more than FIVE problems (I don't know exactly).

In both cases, the interpretation we get is roughly the following: 'For John, the minimal required number of solved problems is at least five.'

While I will not provide an explanation for the generalization in (82), the important point is that this generalization is supported by facts that do not involve the monotonicity of the syntactic environment in which *at least* occurs, but then can help us make sense of the fact that it is a global *PPI*. Only when a 'low' scalar item *i* occurs in a syntactic context where it can give rise to a scalar inference, can *at least* be introduced and take scope over *i*. This predicts that *at least* will not be able to modify expressions that occur in DE-contexts, which goes a long way explaining its PPI-like behavior. The question why this generalization holds is one that I leave for further research. One possible line of investigation is the following. While the semantics of *at least* is a notoriously difficult problem (see Geurts & Nouwen 2007, Nouwen 2010, Büring 2008), it might be viewed as an operator whose main import is that it *prevents* an exhaustivity effect from arising in its scope. If so, it might be

in a sense vacuous (and hence infelicitous) when its prejacent occurs in a position where exhaustification is ruled out by our Economy Condition.

7.2 *Approximately*

The modifier *approximately* seems to behave just like *at least* in all relevant respects.

(90)   Anti-licensing (both short-distance and long-distance)

    a. *Mary is not approximately 20 years old.

    b. ??John doubts that Mary is approximately 20 years old

(91)   Rescuing in DE-environments

    a.   If Mary were not approximately 20 years old, ...

    b.   Nobody doubts that Mary is approximately 20 years old

(92)   Factive Intervention

    a. ??John is not certain that Mary is approximately 20 years old

    b.   John does not know that Mary is approximately 20 years old

While I will not say anything substantial regarding the meaning of *approximately* and how it relates to exhaustification, it is worth pointing out that French *approximativement* (which is the counterpart of *approximately*) appears to obey the very same generalization as *at least*, based on a preliminary investigation with a few French speakers. Namely:

(93)   A sentence S of the form $[_S \ldots \text{approximativement}(\phi) \ldots]$ sounds natural only if the sentence S' that results from deleting *approximativement* in S can give rise to an exhaustivity effect triggered by some material contained in ϕ.

This generalization can be illustrated by the following contrast in French (I didn't test the English counterparts of these sentences):

(94)   a.   (i)   Combien de problèmes Jean a-t-il résolu?

               '*How many problems did Jean solve?*'

         (ii) ?? Jean a résolu approximativement plus de dix problèmes (je ne sais pas exactement).

               '*Jean solved approximately more than ten problems (I don't know exactly).*'

    b.   (i)   Combien Jean doit-il résoudre de problèmes au minimum?

               '*how many problems does Jean has to solve at the minimum.*'

         (ii) (?) Jean doit approximativement résoudre plus de dix problèmes

(je ne sais pas exactement).
'*John approximately has to solve more than ten problems (I don't know exactly).*'

While (94-a-ii) is very odd, (94-b-ii) is relatively acceptable (though not fully natural), under a reading that can be paraphrased as follows:

(95)   The minimal number of problems Jean has to solve is approximately 11.

As was the case for *at least*, the generalization stated in (93) goes a long way explaining why the distribution of *approximately* is that of a global PPI.

7.3   ...and yet others.

Before concluding this paper, let me note that the class of global PPIs seems to include a number of other items. Besides items that are close in meaning to *approximately*, (*around*, *about*), all 'class B' modifiers in the sense of Nouwen (2010) seem to be global PPIs ('at most', 'up to', 'from X to Y', etc.). As Nouwen discusses,these items are characterized by the fact that, in unembedded contexts, they give rise to obligatory epistemic effects. Some of these items at least seem to obey a similar generalization as *at least* and *approximately* (cf. (82) and (93)). Consider for instance the following contrast – perceived by 4 out of 4 informants (all linguists) for its French counterpart (both sentences are perceived as quite deviant in an absolute sense):

(96)   a.   *John solved from more than five to more than ten problems (I don't remember exactly)
         b.   ??John has to solve from more than five to more than ten problems (I don't remember exactly)
              ⤳ The minimal number of problems John has to solve is between 6 and 11 (I don't remember exactly).

Finally, I should note that the class of global PPIs also includes yet other items, such as, for instance, the adverbs *clearly* and *relatively*.

8   Conclusion

I have argued that positive polarity items should be distinguished according to whether their anti-licensing conditions apply locally or globally. For a number of global PPIs (complex disjunctions, *almost*, French *quelques*), the relevant anti-licensing condition can be reduced to an independently motivated hypothesis -

namely, that they have to occur in the scope of an exhaustivity operator or in positions where they can trigger strengthened presuppositions.

Of course, this proposal raises the question why items such as *soit_soit*, *almost* or *quelques*, rather than others, trigger obligatory exhaustification. The fact that complex disjunctions in many languages behave similarly suggests that this property is not accidental. One can speculate that such items obligatory activate alternatives, i.e. that they are, in a sense, obligatorily focused (whether or not this is reflected in their prosody). If we assume that alternatives cannot be evoked if they do not make any contribution, we may be in a position to explain why such items prefer to be in the scope of an exhaustivity operator. This is an issue that I leave for further research.

Appendix: controlled judgments on *soit_soit* and *almost*

A   Data on the distribution of *soit_soit*

In order to confirm judgments that I had gathered in the 'traditional way', I conducted an on-line survey with 14 French-speaking students and researchers in linguistics or philosophy. I excluded every person whose judgments I had collected before, as well as anyone who had ever attended a talk where this work was presented.

A.1   Predictions to be tested

The survey aimed to test the following predictions:

Prediction #1 – Long-distance anti-licensing for *soit_soit* but not for *ou*: *soit_soit* is degraded in the scope of one *distant* DE-operator compared to non-DE contexts, while *ou* isn't.

Prediction #2 – Short-distance anti-licensing for both *soit_soit* and *ou*: Both *ou* and *soit_soit* are degraded in the immediate scope of negation.

Prediction #3 – Rescuing: *soit_soit* is less degraded in the scope of 2 distant DE-operators than in the scope of 1 distant DE-operator, while no similar contrast is expected for *ou*.

Prediction #4 – Flip-flop: *soit_soit* is degraded in the scope of 3 DE-operators compared to when it is in the scope of 2 DE-operators, and there is no similar contrast for *ou*.

Prediction #5 – Factive intervention: *soit_soit* is more acceptable in the scope of a negated factive verb than in the scope of a negated non-factive attitude verb, and no similar contrast obtains for *ou*.

A.2   Procedure and material

I asked for graded judgments, on a scale from 1 to 9, for sentences that appeared together on the screen in groups of 4 or 6 sentences. Participants were explicitly asked to rate each sentence in comparison with all other sentences of the same group. The ordering of sentences within a group was randomized, and the ordering of groups was randomized too, with one exception: two specific groups occurred at the very end (in arbitrary relative order). The reason for this is that these groups tested for the most complicated cases, and this constraint was meant to ensure that subjects would be well trained when evaluating these cases. Each sentence can be

characterized in terms of a) which disjunction appeared in it, and b) in what kind of environment the disjunction appeared. In each group, apart from the factors being manipulated, the sentences were similar to each other (same lexical items, same constructions). Each group tested a certain set of environments, always with both *ou* and *soit_soit*. A group can thus be characterized in terms of the environments it tested. Here is a compact description of all the groups (see section A.6 for an exhaustive description).[38]

Groups	Environments
1A, 1B	No negation, Clause-mate negation, Distant negation
2A, 2B, 2C, 2D	0 DE-operator, 1 distant DE-operator
3	0 DE-operator, 1 distant DE-operator, 2 distant DE-operators
4	1 distant DE-operator, 2 distant DE-operators
5A, 5B	Negated non-factive attitude verb, Negated factive verb
6A, 6B	1 DE-operator, 2-DE operators, 3 DE-operators

A.3 Data treatment

The comparisons I will report always involve 4 conditions, all instantiated within the same groups, defined by two factors: **Disjunction Type** (*ou* vs. *soit*) and **Environment** (e.g. *1 DE distant operator* vs. *no DE operator*).

We are interested in a) contrasts between two conditions (e.g. contrast between *soit_soit* in **1 DE**-environments vs. in **0 DE**-environments), and b) interactions between factors (e.g. we want to know whether whatever contrast there may be for *ou* in **1 DE** vs. **0 DE**-environments is marginal compared with the contrast found with *soit_soit*).

To test for *contrasts* between two conditions, I compute, for each subject, the median value across groups of the *difference* between the ratings given by this subject to the two relevant conditions. I then test by means of a Wilcoxon-signed rank test[39] whether these median values are significantly higher than 0.

To test for *interactions* between factors, given that the conditions for using a parametric test such as a 2-way ANOVA are not necessarily met, I test the *difference between differences within each pair of conditions*. That is, for each subject s, I compute the median value across groups of $(X1(s) - Y1(s)) - (X2(s) - Y2(s))$, where X and Y corresponds to the two levels of the first factor, and 1 and 2 to the two

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38 Groups 6A and 6B are those that always appeared after all others

39 I report the results of Wilcoxon signed-rank tests in terms of the V-statistics, the sum of all positive ranks. The more standard W, i.e. the difference between positive and negative ranks, is uniquely determined by V, the sample size and the number of ties.

levels of the second factor, and $X1(s)$ is the rating that subject s assigned to condition $X1$. I then test by means of a Wilcoxon signed-rank test whether these median values are significantly higher than 0. If so, I conclude that there is a significant interaction, i.e. that the difference between $X1$ and $X2$ is greater than between $Y1$ and $Y2$.

Finally, when I report an aggregate value for a given score, the reported value is the median value of the median values obtained for each subject.

A.4   Results

A.4.1   Prediction #1 – Long-distance anti-licensing

To test for Prediction #1, let us consider all groups (1A, 1B, 2A, 2B, 2C, 2D, 3) which instantianted (at least) the four conditions defined by the following factors: **Disjunction Type**: *soit_soit* vs. *ou*, and **Environment**: *1 distant DE-operator* vs. *no DE*-operator.[40]

Looking at all such groups, we find, a) that *soit_soit* is degraded in the scope of exactly 1 DE distant operator as opposed to when it is not in a negative context (3 vs 8, $V = 105$,[41] $p < .0005$), and b) that whatever comparable contrast there may be for *ou* (8.25 vs 8.5) is either in the opposite direction or marginal compared with the one found with *soit* (Difference in differences: $V = 105, p < .0005$).[42]

A.4.2   Prediction #2 – Short-distance anti-licensing

Two groups (1A, 1B) were designed in part to test Prediction #2. They each consisted of 6 sentences, defined by two factors: **Disjunction Type** = *ou* or *soit*, and **Environment** = *close negation*, *distant negation*, or *no negation*.[43]

As predicted, *ou* is degraded in the immediate scope of negation vs. in a positive context (4.5 vs. 8, $V = 83.5, p < .005$). Furthermore, it is not similarly degraded when in the scope of a distant negation. Specifically, whatever contrast there may be be between the **distant negation** context (8.25) and the **no negation** context

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40 Some of these groups instantiated also two additional conditions: *ou* vs. *soit_soit* in a positive environment. cf. section A.6.

41 A value of $V = 105$ means that every single subject reported a contrast (i.e. all ranks are positive, so $V = 1 + 2 + \ldots + 14 = 105$) .The associated *p*-value is then as low as is mathematically possible given the sample size.

42 These groups included cases where the DE-operator is a DE quantifier such as *fewer than ten students*, which I classified as a 'long-distance' case. If we further divide these groups into two subtypes, i.e. those that involved a DE-quantifier in subject position and those that involved a DE-operator separated from the *soit_soit* or *ou* by a clause boundary, we find exactly the same pattern for each subtype.

43 'distant negation' includes cases where the relevant disjunction is in the scope of a negative attitude verb

(8) for *ou*, this contrast is either in the opposite direction or marginal compared to the corresponding contrast for *soit_soit* in the very same groups (Difference in differences: $V = 105$, $p < .0005$). As expected, compared to positive environments, *soit_soit* is degraded both in the immediate scope of negation (2 vs. 8.25, $V = 105$, $p < .0005$) and in the scope of a distant DE-operator (3.75 vs. 8.25, $V = 105$, $p < .0005$).

A.4.3 Prediction #3 – Rescuing (1 vs. 2 DE-operators)

To test for Prediction #3, i.e. that *soit_soit* is subject to rescuing, let us consider all groups that included both sentences with 1-DE operator and sentences with 2-DE operators (groups 3, 4, 6A, 6B).[44] We thus focus on four conditions, defined by the two following factors: **Disjunction Type** and **Environment** = 1 vs. 2 DE-operators.

First, *soit_soit* is, as expected, significantly more acceptable under the scope of 2 DE-operators than under the scope of 1 DE-operator (7.75 vs 3.75, $V = 101$, $p < .001$). Second, there is no comparable contrast between 2 DE-environments (8.75), and 1 DE-environments (9) in the case of *ou* (Difference in differences: $V = 105$, $p < .0005$).

A.4.4 Prediction #4 – Flip-flop (1 vs. 2 vs. 3 DE-operators)

Two groups (6A, 6B) included 6 sentences based on the following factors: **Disjunction Type** and **Environment** = 1, 2 or 3 DE-operators. As expected, in these groups, *soit_soit* is significantly degraded when in the scope of 3 DE-operators compared to the case where it is in the scope of 2-DE operator (5 vs 8, $V = 91$, $p < .0005$). There is no similar contrast for *ou* between 2DE (7.75) and 3DE (7.50) environments (Difference in differences : $V = 91$, $p < .0005$). As expected, in these groups, *soit* is also worse in the scope of 1 DE-operator than in the scope of 2 DE-operators (4.75 vs 8, $V = 96$, $p < .005$). There is no similar contrast for *ou* between 2DE (7.75) and 1DE (9) environments (Difference in differences: $V = 105$, $p < .0005$).[45]

A.4.5 Prediction #5 – Factive intervention

Two groups (5a, 5b) tested the contrast between *neg+'know that'* and *neg+'believe/think that'*, i.e. tested specifically for factive intervention. As predicted, when *soit_soit* oc-

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44 Again, these groups include groups that instantiated more than just these conditions, but also conditions with no DE-operators. Cf. section A.6.

45 If anything, there is a contrast in the opposite direction, i.e. *ou* in these groups is slightly more acceptable in 1DE-environments than in 2DE-environments, though this contrast is only marginally significant (V=25, p=.078).

curs in the scope of a negated factive verb, it is significantly more acceptable than in the scope of a negative non-factive attitude verb (7.25 vs. 3.50, $V = 105, p < .0005$). In the case of *ou*, there is no similar contrast (7.50 vs. 7.75, Difference in differences: $V = 92.5, p < .01$).

A.5   Conclusion

The results of this survey support all the generalizations made in the paper regarding the distribution of *soit_soit*. Namely, *soit_soit* is degraded when it occurs in a globally DE-environment, while *ou* is degraded only in the scope of a clause-mate negation. Furthemore, *soit_soit* is significantly more acceptable in the scope of a negated factive verb than in the scope of a negated non-factive verb (factive intervention).

A.6   Detailed description of the survey

Here is a compact description of the survey.[46]

Group #1A – Environments: no negation, close negation, distant negation – 6 sentences

Marie [a]/[*n'* a *pas*] invité [Léa *ou* Jean]/[*soit* Marie *soit* Paul] à dîner.

Je *ne* pense *pas* que Marie ait invité [Pierre *ou* Julie]/[*soit* Anne *soit* Paul] à dîner.

Group #1B – Idem

Marie [a]/[*n'* a *pas*] mangé [les pommes *ou* les bananes]/[*soit* les pommes *soit* les bananes].

Je *doute* que Nicolas ait mangé [les poires *ou* les oranges]/[*soit* les pommes *soit* les bananes].

Group #2A – Environments: 0 vs. 1 distant DE-operators – 4 sentences

Il est [probable]/[*peu* probable] que le fugitif ait fui [en Allemagne *ou* en Italie]/[*soit* en Allemagne *soit* en Italie]

Group #2B – Idem

[Certains étudiants]/[*Aucun* étudiant] [parlent]/[ne parle] [russe *ou* italien]/[*soit* espagnol *soit* anglais]

Group #2C – Idem

[Beaucoup]/*peu* de français connaissent [l'italien *ou* le russe]/[*soit* l'anglais *soit* le russe]

Group #2D – Idem

Parmi mes étudiants, [plus de dix]/[*moins de dix*] parlent [espagnol *ou* italien]/[*soit* italien *soit* allemand]

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46 Within the same groups, I didn't always keep constant the proper names or nouns occuring in a sentence, but the nouns used within a group always belonged to the same semantic class (e.g. fruit names). The schematic description I use here ignores some of these slight variations.

Group #3 – Environments: 0, 1 or 2 distant DE-operators – 6 sentences

Je pense/*doute* qu'il serait utile que Jacques apprenne [l'italien *ou* l'espagnol]/[*soit* le russe *soit* l'italien].

Personne ne *doute* qu'il serait utile que Jacques apprenne [l'allemand *ou* l'anglais]/[*soit* l'anglais *soit* l'espagnol].

Group #4 – Environments: 1 or 2 distant DE-operators – 4 sentences

[J'ai emmené]/[Je *n'*emmène *jamais*] Marie au cinéma *sans* qu'elle ait demandé la permission [à son père *ou* à sa mère]/[*soit* à son père *soit* à sa mère].

Group #5A – Environments: negated non-factive attitude verb, negated factive verb – 4 sentences

Marie a dit à ses parents qu'elle désire faire des études scientifiques, mais ils ne *croient* pas qu'elle prévoie de s'inscrire [en médecine *ou* en biologie]/[*soit* en médecine *soit* en biologie].

Léa a dit à ses parents qu'elle désire faire des études scientifiques, mais ils ne *savent* pas qu'elle prévoit de s'inscrire [en médecine *ou* en biologie]/[*soit* en médecine *soit* en biologie].

Group #5B – Idem

Bien que Jean soit un étudiant brillant, Anne ne *croit* pas qu'il étudiera [à Yale *ou* à Princeton]/[*soit* à Yale *soit* à Princeton].

Bien qu'elle soit très informée, Marie ne *sait* pas que Paul étudiera [à Yale *ou* à Princeton]/[*soit* à Yale *soit* à Princeton].

The two following groups always appeared after all others.

Group #6A – Environments: 1, 2 or 3 DE-operators – 6 sentences

Je trouve *inimaginable* d'habiter [à Paris *ou* à New-York]/[*soit* à Paris *soit* à New-York].

Je trouve *inimaginable* de *ne pas* habiter [à Paris *ou* à New-York]/[*soit* à Paris *soit* à New-York].

Je trouve *ne* trouve *pas inimaginable* de *ne pas* habiter [à Paris *ou* à New-York]/[*soit* à Paris *soit* à New-York].

Group #6B – idem

Je trouverais *inadmissible* que tu votes [pour Sarkozy *ou* pour Hollande]/[*soit* pour Sarkozy *soit* pour Hollande].

Je trouverais *inadmissible* que tu *ne* votes *pas* [pour Sarkozy *ou* pour Hollande]/[*soit* pour Sarkozy *soit* pour Hollande].

Je *ne* trouverais *pas inadmissible* que tu *ne* votes *pas* [pour Sarkozy *ou* pour Hollande]/[*soit* pour Sarkozy *soit* pour Hollande].

B Data on the distribution of *almost*

I ran a survey on-line on the distribution of *almost*, with 42 native English-speakers, recruited through the Amazaon Mechanical Turk platform. The general procedure was exactly the same as with the survey on *soit_soit*. I also applied the same type of data treatment. I systematically contrasted *almost* with a 'control-item'. For instance, *almost all* in a certain environemnt was compared with *all* in the same environment, or *almost having full nuclear capacity* was compared with *being close to having full nuclear capacity* in the same environment.

B.1 Predictions to be tested

The survey aimed to test the following predictions:

Prediction #1 – Anti-licensing:
> *almost* is degraded in the scope of one DE-operator, compared to the control item, both if the DE-operator is clause-mate negation and if it is a distant negation of some other type of DE-operator.

Prediction #2 – Rescuing:
> *almost* is less degraded in the scope of 2 distant DE-operators than in the scope of 1 distant DE-operator (rescuing), while no similar contrast is expected for the control item..

Prediction #3 – Factive intervention:
> *almost* is more acceptable in the scope of a negated factive verb than in the scope of a negated non-factive attitude verb (or a negative non-factive attitude verb), and no similar contrast obtains for control items.

B.2 Material

The survey started with a group of 6 sentences that served as training items and were otherwise not relevant. After this first group, sentences appeared together in groups of 4 sentences. In each group, two types of environments where tested, and both *almost* and the control item were tested in each environment. The ordering of groups, and of sentences within each group, was randomized. Here is a compact description of the groups, based on the type of environments they tested (see section B.5 for an exhaustive description).

Groups	Environments
1A, 1B, 1C	No negation, Clause-mate negation
2A, 2B, 2C, 2D, 2E	0 DE-operator, 1 distant DE-operator
3	1 distant DE-operator, 2 distant DE-operators
4A, 4B	Negated non-factive attitude verb, Negated factive verb

B.3   Results

B.3.1   Prediction #1 – Anti-licensing

Main result.   Across all groups which tested both positive environments and DE environments (1A, 1B, 1C, 2A, 2B, 2C, 2D, 2E), *almost* is, as predicted, degraded in DE environments compared to positive environments (4 vs. 8, $V = 820, p < 10^{-11}$). Whatever contrast there may be for control items between positive and negative environments (8 vs. 9) is marginal compared to what is found for *almost* (Difference in differences: $V = 741, p < 10^{-11}$).

More fine-grained results.   We observe the same pattern by treating separately groups in which the DE-operator was a clause-mate negation (1A, 1B, 1C) and groups where the DE-operator was more distant (2A, 2B, 2C, 2D, 2E).

That is, *almost* is degraded in the immediate scope of negation compared to cases where the negation is removed (3.5 vs. 8.25, $V = 903, p < 10^{-11}$), and whatever contrast there may be for control items (9 vs 8.5) is marginal compared to what is found for *almost* (Difference in differences: $V = 861, p < 10^{-12}$)

Likewise, *almost* is also degraded when in the scope of a distant DE-operator compared to cases (in the same groups) where it occurs in a positive environments (5 vs. 8, $V = 591, p < 10^{-9}$). Whatever whatever contrast there may be for control items (9 vs 8.5) is marginal compared to what is found for *almost* (Difference in differences: $V = 485, p < 10^{-7}$).[47]

B.3.2   Prediction #2 – Rescuing

The only group that tested for rescuing was Group #3. In this group, as predicted, *almost* is degraded in the scope of 1DE-operator compared to when it occurs in the scope of 2 DE-operators, even though the size of the observed effect is small (3 vs. 4, $V = 288, p < .05$). Whatever contrast there may be for control items (7 vs. 7)

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47 If we further distinguish between groups in which the DE-operator is a DE-quantifier in subject position and those in which it is separated from the *almost* or the control item by a clause boundary, we find exactly the same general pattern for both cases.

is marginal compared with the one found with *almost* (Difference in differences: $V = 376.5, p < .05$).

B.3.3 Prediction #3 – Factive intervention

Groups 4A and 4B tested for factive intervention. They contrasted *almost* and a control item in the scope of a) a negated non-factive attitude verb (*croire*) and b) a negated factive verb (*savoir*).

As predicted, *almost* is degraded in the scope of a negated non-factive verb compared to when it is in the scope of a negated factive verb (4.75 vs. 6, $V = 605, p < 0.0005$). Furthermore, there is no similar contrast for control items (Difference in differences: $V = 660, p < 10^{-6}$). In fact, there is a contrast in the opposite direction, with the control item receiving a higher score in the scope of a negated non-factive verb than in the scope of a negated factive verb (8 vs. 6.25, $V = 408.5, p < .0005$).[48]

B.4 Conclusion

The results of the survey on *almost* confirm the main empirical generalizations of the paper regarding its distribution: *almost* is, everything else being equal, significantly more acceptable when it occurs in a globally UE environment than in a DE environment. It thus qualifies as a global PPI. When under the scope of a negated attitude verb, *almost* is significantly more acceptable if the verb is factive (factive intervention).

B.5 Detailed description of the survey

Training group
    Mary ate/didn't eat some of the rice at dinner
    Mary has/hasn't already been in Rome
    Mary has/hasn't often been in Rome

Group #1A – Environments: No negation, clause-mate negation
    Mary [solved]/[*didn't* solve] [all]/[*almost* all] of the problems on time.
Group #1B – Idem
    Sue [ate]/[*didn't* eat] [all]/[*almost* all] of the rice at dinner.
Group #1C – Idem
    This country is/*isn't* close to having full nuclear capacity.
    This country [*almost* has]/[*doesn't almost* have] full nuclear capacity.

Group #2A – Environments: 0 DE-operator, 1 distant DE-operator
    I [think]/[*don't* think] that Mary solved [all]/[*almost* all] of the problems on time.

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48 This last comparison was not initially planned.

Group #2B – Idem

I [believe]/[*doubt*] that Sue ate [all]/[*almost* all] of the rice at dinner.

Group #2C – Idem

This country [is]/[is *not*] believed [to be close to having full]/[to have *almost* full] nuclear capacity.

Group #2D – Idem

[Some]/[*No*] students did [all]/[*almost* all] of the homework before the deadline.

Group #2E – Idem

[Many]/[*Few*] countries [are close to having full]/[*almost* have full] nuclear capacity.

Group #3 – Environments: 1 or 2 distant DE-operators

I [left]/[*never* leave] the party *without* having told [all]/[*almost* all] of the guests that I was leaving.

Group #4A – Environments: negated non-factive attitude verb, negated factive verb

Lisa informed her parents that she did very well at the exam, but they don't [*think*]/[*know*] that she solved [all]/[*almost* all] of the problems.

Group #4B – Idem

Even though John is a very bright student, Ann *doesn't think* that he will be admitted to [all]/[*almost* all] of the universities he applied for.

Even though Sue is very well informed, she *doesn't know* that Peter was admitted to [all]/[*almost* all] of the universities he applied for.

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