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Polarity and Modality

A dissertation submitted in partial satisfaction
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Doctor of Philosophy in Linguistics

by

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À mes chers parents.

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ABSTRACT OF THE DISSERTATION

Polarity and Modality

by

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Doctor of Philosophy in Linguistics

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This dissertation investigates two main topics, namely polarity sensitivity and the syntax and semantics of modals, as well as the intersection of the two.

It offers a general theory of licensing, which applies to positive and negative polarity items alike. Four fundamental properties are established: (i.) licensing is environment-based, i.e. it is constituents that license polarity items (PIs); (ii.) only some constituents are eligible for licensing; (iii.) the evaluation of constituents is cyclic; (iv.) within a given constituent A, the licensing of a PI π is dependent on the licensing of all other PIs within A. These properties are used to show, against the consensus among researchers, that PPIs of the *some*-type are vulnerable to the very logical property that NPIs of the *any*-type require, namely downward-entailingness.

Some facts involving NPIs licensed in contexts whose monotonicity is ruined by a presupposition have led some to hypothesize that downward-entailingness is in fact too strong a requirement; proposals were made to weaken it (cf. von Fintel 1999). This dissertation shows that such a move is unwarranted: NPIs are indeed anti-licensed by presuppositions. But it also provides evidence that certain presuppositions are not incorporated into the meaning that is relevant for NPI licensing, and therefore fail to

be disruptive. In light of these facts, the dissertation offers an original typology of presuppositions based on their interaction with NPIs.

On the positive polarity side, the dissertation shows that the deontic modals *must*, *should* and *supposed* are all PPIs which raise in order to avoid being in the scope of a clausemate negation; it also establishes that *should* has a dual nature (it is a neg-raising predicate, which achieves wide scope through a homogeneity inference, as well as a PPI) and that *supposed* exhibits a neg-raising behavior under certain pragmatic conditions which shed new light on the neg-raising phenomenon.

Lastly, the dissertation focuses on the stativity of root modals and derives the phenomenon known as actuality entailment (i.e. the inference, which obtains in the perfective, that the complement of a root modal holds in the actual world, cf. Bhatt 1999 and Hacquard 2006) as the effect of an operation of aspectual coercion made necessary to repair the incompatibility between a stative predicate and the perfective viewpoint aspect.

CHAPTER 1

Introduction

There are two main lines of investigation in this dissertation. The first line is the acceptability conditions of polarity items (PIs). The second line is the syntax and semantics of root modals. The two lines intersect, as the thesis also investigates the polarity sensitivity of certain root modals (deontic *must, should, supposed*).

Four self-contained articles make up the thesis:

– Chapter 2, 'Domains of Polarity Items', offers a theory of PI licensing: it shows that polarity items (*any, some*) are sensitive to the monotonicity of their syntactic environment rather than to the presence of some operator, and that the two phenomena, negative and positive polarity, are the exact mirror image of each other.

– Chapter 3, 'Presuppositions and NPI Licensing', deals with exceptions to the acceptability conditions established in Chapter 2, i.e. cases where NPIs are available while their syntactic environment is made non-monotonic by the triggering of a presupposition.

– Chapter 4, 'Neg-raising and Positive Polarity: The View from Modals' is an in-depth analysis of the scopal properties of three universal deontic modals, namely *must, should* and *supposed.*

– Chapter 5, 'Actuality Entailments and Aspectual Coercion', explores the effects of the stativity of root modals in interaction with the perfective aspect.

1.1 Chapter 2: Domains of Polarity Items

It is generally assumed (since the seminal work of Fauconnier (1975, 1978) and Ladusaw (1979)) that the logical notion of downward-entailingness—a generalized notion of negativity—plays a crucial role in the licensing of negative polarity items (NPIs), e.g. *any*. Downward-entailing (DE) expressions, e.g. *no, few,* reverse the direction of entailment in their argument. However the question of what it is that ultimately licenses NPIs is not settled. There are two ways the role of DEness can be understood. The two different approaches are apparently close but they really make distinct predictions, a fact which is not usually fully appreciated. Each approach has its proponents:

– Operator-based licensing: For von Fintel (1999), Szabolcsi (2004), Guerzoni (2006), Gajewski (2009) a.o., NPIs are licensed by DE operators. In order to be licensed in a given sentence *S*, an NPI π^- must be c-commanded by a DE operator in *S:* whether an element present in the syntactic context of π^- has a potential to break the monotonicity of this context is irrelevant; also irrelevant is the possibility that two DE expressions compose to yield an upward-entailing context.

– Environment-based licensing: For Chierchia (2004), Gajewski (2005), a.o., an NPI π^- must be placed in some downward-entailing context. Licensing of π^- in *S* is only possible if there exists a constituent of *S* which is DE w.r.t. the position of π^-, taking into account the contribution to meaning of *all* elements present in that context. In a word, licensing is done by constituents.

I take issue with the operator-based approach and show, by producing novel data, that the environment-based approach is correct, and that it can be extended seamlessly to Positive Polarity Items (PPIs), e.g. *some.* A PI π is licensed in a sentence *S* only if it is placed in at least one constituent A of *S* which has the right monotonicity w.r.t. its position (i.e. upward for *some,* downward for *any*) and which is such that all other PIs

in A are also licensed within A. The second clause expresses the *dependent* character of PI licensing, which is established in this article: the licensing of π in A depends on the licensing of all other PIs in A.

That constituents are the real licensers of PIs can be inferred from the fact that only certain constituents are eligible for licensing. I call 'domain of a PI π' a constituent upon which the licensing of π is checked: I say that π has a downward (resp. upward) domain if and only if there is a domain of π which is DE (resp. UE) w.r.t. its position. I will restrict myself to two examples here, namely *some* and *a single.* Within each clause, constituents that do not include the projection for negation are not eligible for the licensing of these PIs. To see this, consider the pair below:

(1) a. It's impossible that John understands something. ✓narrowest scope of SOME

b. John doesn't understand something. *narrowest scope of SOME

Some can be licensed on a constituent as large as a clause: although (1a) contains a DE expression in the form of *impossible,* it also contains a constituent which is upward-entailing w.r.t. the position of *some,* namely the embedded clause. This is sufficient to satisfy the requirement of *some.* But in (1b), the smallest eligible domain of *some* is a constituent that encompasses negation, leading to anti-licensing.

In (2a) and (2b), we complicate the picture by adding some DE expressions: (2a) contains an eligible constituent, namely the phrase headed by matrix negation, which is UE w.r.t. *some* (due to the composition of two DE expressions); in (2b) on the other hand, the eligible constituents contain either one or three DE expressions and are thus all DE w.r.t. *some.*

(2) a. It's impossible that John doesn't understand something.

✓narrowest scope of SOME

b. It's not impossible that John doesn't understand something.

*narrowest scope of SOME

For the NPI *a single* to be licensed, it has to have at least one eligible DE domain.

(3) a. It's impossible that John did a single thing to help the Mafia.

b. *It's not impossible that John did a single thing to help the Mafia.

c. Not that it's impossible that John did a single thing to help the Mafia.

The condition is met in (3a), where the matrix clause is one such constituent; in (3b) however, the only eligible constituents which contain at least one DE expression contain exactly two of them: the phrase headed by matrix negation is therefore UE w.r.t. *a single.* In (3c), there are eligible domains of *a single* that contain one DE expression (*impossible*) without also containing the other (*not*), e.g. the intermediate clause: therefore the requirement is met and *a single* is licensed.

The dependent character of licensing is manifest when several PIs co-occur in the same sentence.

(4) a. It's impossible that someone stole something.

b. It's impossible that anyone stole anything.

c. *It's impossible that someone stole anything.

d. It's impossible that anyone stole something.

The two PPIs in (4a) are licensed on the embedded clause; the two NPIs in (4b) are licensed on the matrix clause. But in (4c), there is no eligible UE domain of *someone* that doesn't also contain an anti-licensed NPI (*anything*); conversely, there is no eligi-

ble DE domain of *anything* that doesn't also contain an anti-licensed PPI (*someone*). The contrast with (4d) supports this analysis. Unlike (4c), (4d) contains an eligible UE domain of *something* that doesn't contain any anti-licensed PI, namely the phrase in the embedded clause that would contain negation if there was one (assuming that negation is lower than subjects); and an eligible DE domain of *anyone* is available, namely the matrix clause. Although this DE domain contains a PPI, no conflict arises, for *something* was independently licensed, at what appears to be a preceding stage of a licensing *cycle*.

The article further supports the claim that licensing is dependent and cyclic, by bringing to light more conflicts between PIs. I show that we should revise our conception of licensing: it is in fact the validity of constituents themselves that matters to the system that checks NPI licensing.

1.2 Chapter 3: Presuppositions and NPI Licensing

It is sometimes proposed that downward-entailingness is too strong a requirement for the licensing of NPIs, and should be somehow weakened (von Fintel 1999 and much subsequent work). In effect, NPIs can appear in contexts that are not, strictly speaking, DE with respect to their position, due to the presence of a presupposition. This problem has beset the theory of polarity ever since the DE criterion was proposed (see Ladusaw 1979). In (5a) and (5b), NPIs are licensed although they occur in the scope of the trigger (*only* and *sorry* respectively) of a presupposition which is a monotonicity-breaker.

(5) a. Only John saw anything.

b. John is sorry that Mary bought any car.

In light of these facts, it is generally assumed that NPIs are not vulnerable to presuppositions. I show that this claim is incorrect. There are some presuppositions which disrupt the licensing of some *any*-type NPIs, and a proper superset of those presuppositions disrupt the licensing of *yet*-type NPIs. Consider (6):

(6) *Context:* Mary read a novel.
*Mary read a novel, but I don't think that $[\text{John}]_F$ read anything too.

(7) *Context:* Mary read a novel.
Mary read a novel, but I don't think that $[\text{John}]_F$ read something too.
Presupposition: Someone other than John read something.

I show that the additive particle *too* triggers a presupposition which creates a non-monotonic environment in the position of the NPI *anything*, provided that the meaning that is relevant for NPI licensing incorporates presuppositions. Another example of disruption by presupposition can be found in French (and some English dialects). NPIs in the complement clause of a cognitive factive predicate, e.g. *know*, cannot be licensed by a superordinate negation:

(8) *Context:* Marie read a novel.

a. **Jean ne sait pas que Marie a lu quoi que ce soit.*
Jean NEG knows NEG that Marie have.IND read what that this be.SUBJ
Intended: '*Jean doesn't know that Marie read anything.*'

b. Jean ne sait pas que Marie a lu quelque chose ('*something*').

c. *Presupposition of (8b):* Marie read something.

When it comes to strict NPIs (*yet, until, in years, either, one bit*), it can be shown that almost all presuppositions are disruptive: (9) is to be contrasted with (5a) above.

(9) *Only John has exercised in years.

The article shows that it is indeed presuppositions that are to be blamed for anti-licensing in those cases, and demonstrates that only option is possible: the disruptive power of presuppositions is not tampered with in any way to salvage NPIs. Therefore NPI licensing in the scope of presupposition triggers cannot be used to support the claim that weakening is needed.

There is good evidence that presuppositions that fail to cause disruption are not factored into the meaning that is taken into consideration for licensing, although they project (i.e. are part of the meaning of the sentence at the end of the day). But that doesn't mean that there exists a general strategy to weed out offending presuppositions. I hypothesize that presuppositions are incorporated in stages into the meaning of a sentence, and that NPI licensing itself occurs at a certain point along the temporal axis of this incorporation. NPIs of different strengths are checked for licensing at different points on this axis; strict NPIs are checked after weak ones. This hypothesis, still in need of confirmation from a cross-linguistic investigation, is motivated by implicational hierarchies which indicate that whenever a presupposition ρ disrupts the licensing of a weak NPI π_w^-, it disrupts the licensing of any strict NPI π_s^-.

1.3 Chapter 4: Neg-raising and Positive Polarity: The View from Modals

This article addresses the puzzle of the wide scope over a clausemate negation of certain modal verbs, i.e. deontic *must, should* and *supposed:*

(10) a. John mustn't jog. *NEG>MUST;✓MUST>NEG

b. John shouldn't jog. *NEG>SHOULD;✓SHOULD>NEG

c. John isn't supposed to jog. *NEG>SUPPOSED;✓SUPPOSED>NEG

I argue that all three verbs are base-generated under negation, but they can scope out and have to do so, because they are Positive Polarity Items: I thus show that alongside QR of individual quantifiers, QR of quantifiers over possible worlds (modal verbs) exists. As a first step, I provide criteria to recognize neg-raising verbs. These verbs, e.g. *want* and *think*, also take wide scope over negation, but this scope is not syntactic, i.e. they do not need to raise: they trigger an excluded middle inference (the inference that they hold either of their complement or of its negation), which, in concert with the assertive content of the negative sentence, yields the inference that they hold of the negation of their complement:

(11) a. John doesn't want to help me.

b. *Paraphrasable as:* John wants not to help me.

Next, the neg-raising criteria allow me to show that deontic *must* is not a neg-raiser. I also provide positive tests that demonstrate that it is what I call a mobile Positive Polarity Item, i.e. a PPI that has the ability to QR out of the scope of an offending clausemate negation.

These two classes of criteria (for neg-raising and for positive polarity) are put to use to show that *should* has a dual nature: it is both a mobile PPI and a neg-raiser. I also investigate its argument structure and bring to light its assessor dependence (it shares this property with epistemic modals, e.g. $might_{epis}$ and $must_{epis}$).

The last verb, *supposed*, is particularly interesting for what it tells us about neg-raising. Just like *must* and *should*, it is a mobile PPI. In some dialects, it is nothing but a pure PPI, but in others, it is also a neg-raiser, but a part-time one. It is only when the participants in the conversation assume that some individual is opinionated

about the proposition expressed by the complement of *supposed* that neg-raising is possible. I thus show that, like *should* and all other known neg-raisers, *supposed* is assessor dependent and I therefore discuss the implications of the findings presented in the article (in particular, intermittent neg-raising with *supposed* correlated with the assumption about an opinionated assessor) for our understanding of the source of the neg-raising phenomenon.

1.4 Chapter 5: Actuality Entailments and Aspectual Coercion

Bhatt (1999) and Hacquard (2006) claim that in French, the complement of a root modal verb must hold in the actual world (12a), iff the Viewpoint-Aspect on the modal verb is perfective (i.e. when the morphology is *passé composé*): this is called an actuality entailment (AE). Negating this inference in a continuation is infelicitous.

(12) a. *Hier Max a pu s'évader de sa cellule, #mais ne l' a pas fait.*
yesterday Max has can.PP escape from his cell, but NEG it has NEG done

'Yesterday, Max has been able to escape from his cell, but he didn't escape.'

b. Hier Max pouvait *(Imparfait)* s'évader de sa cellule, mais ne l'a pas fait.

The key to understanding the phenomenon, I argue, lies in the stativity of root modal verbs, which I demonstrate carefully in this article. This fact is absolutely crucial and is seldom taken into consideration (it plays no role in Hacquard's (2006) analysis for example; I show that this analysis cannot be empirically adequate due to this oversight). Being stative predicates of eventualities, root modals are not allowed under the perfective Viewpoint Aspect, unless some meaning-enrichment process known under

the name of Aspectual Coercion (de Swart 1998, Bary 2009) takes place. I illustrate the phenomenon with the non-modal stative predicate *Jean be angry* first:

(13) a. *#Hier, Jean a été en colère.*
yesterday Jean has be.PP in wrath
Intended: *'Yesterday, Jean has been angry.'*

b. *À un moment donné, Jean a été en colère.*
at a moment given Jean has be.PP in wrath
'At some point, Jean was angry.'

c. *Chaque fois que Jean a été en colère, Pierre lui a parlé.*
each time that Jean has be.PP in wrath Pierre to-him has talked
'Each time Jean was angry, Pierre talked to him.'

While a clash between the perfective and stativity is manifest and non-mitigated in (13a), (13b) and (13c) are perfectly acceptable, due to the presence of a covert operator which turns the stative predicate into an eventive one (this operator is licensed in the presence of certain quantificational temporal adverbials). The coercion illustrated in (13b)-(13c) is called by Bary (2009) the complexive coercion (there are other kinds, cf. de Swart 1998).

The complexive coercion can be applied to the predicate formed with *pouvoir* as well:

(14) *À un moment donné, le prisonnier a pu s'évader, mais ne l' a pas fait.*
at a moment given, the prisoner has can.PP escape, but NEG it has NEG done

(15) *Chaque fois que le prisonnier a pu s'évader, il ne l' a pas fait: il a préféré rester dans sa cellule.*
each time that the prisoner has can.PP escape, he NEG it has NEG done he has preferred stay in his cell

In the above sentences, the Actuality Entailment, as shown by the continuation, is not necessary. But it can be shown that it is in fact possible. That is, (14) and (15) are ambiguous between two interpretations brought about by two kinds of operators: the operator responsible for the complexive coercion on the one hand, and the operator responsible for a yet undocumented kind of coercion (and responsible for the AE) on the other hand.

The evidence for the existence for this other kind of coercion operator can be found in the following sentences:

(16) a. La maison a coûté 100 000 €.
(The house has cost.PP €100.000)
⇝It was sold.

b. La maison coûtait 100 000 €.
(The house cost €100.000).
$\not\rightsquigarrow$It was sold.

(17) a. Jean a eu du tact hier.
(Jean has had tact yesterday)
⇝He did something tactful.

b. Jean avait du tact hier.
(Jean was tactful yesterday)
$\not\rightsquigarrow$He did something tactful.

The stative predicates *the house cost €100.000* and *Jean be tactful* are amenable to what I call the actualistic coercion (brought about by a covert ACT operator, for which I provide evidence using a gapping test). It is the same coercion (and the same operator) which is at play in (12a). In other words, Actuality Entailments are the effect of the

ACT operator inserted in syntax to avoid an aspectual clash between the perfective aspect and a stative eventuality predicate. The outcome of this operator is an eventive predicate of eventualities: what is asserted is the existence of some event, which is pragmatically determined (it is a monetary transaction in (16a), and it is an event in the denotation of the complement of *pouvoir*, i.e. an escape, in (12a)).

CHAPTER 2

Domains of Polarity Items

2.1 Introduction

This article deals mainly with the acceptability conditions of the polarity items *some* and *any*. These items have two things in common: they are existential quantifiers[1] and their occurrence is restricted to certain configurations. They differ though in that their distribution obeys different requirements, as can be best appreciated when they are placed in the scope of a clausemate negation: while *some* cannot be interpreted in the semantic scope of a clausemate negation, but can appear in a positive unembedded sentence, *any* shows the opposite properties.

(1) a. *John didn't understand something.[2]

b. John understood something.

c. John didn't understand anything.

d. *John understood anything.

[1]There is a debate about the quantificational force of the Negative Polarity Item *any:* some, e.g. Quine (1960), argue that it is a wide-scope universal quantifier, but I consider that Fauconnier's (1978) arguments for analyzing it as a narrow-scope existential quantifier are compelling. For example, (i) can be used truthfully in a situation in which there are four men among the ten under discussion about whom the speaker has no uncertainty (because he knows Susan didn't marry them):

(i) I wonder if Susan married any of those ten men. [modified from Fauconnier 1978, ex. 34]

[2]The asterisk is meant to exclude the reading where *some* is interpreted in the semantic scope of negation; the sentence is grammatical with *some* interpreted above negation.

This paradigm seems to call for a simple unifying explanation, whereby *some* and *any* have opposite requirements vis-à-vis *negation*, and are therefore in complementary distribution (such an idea was put forward in the early days of the study of polarity items by Klima (1964)). Unification is, I think, a desideratum of any theory of polarity. But the complementary distribution hypothesis is plagued by so many apparent counterexamples—(2), where negation is in a superordinate clause with respect to the polarity items, is one of them—that many if not all researchers have long discarded it.

(2) a. It's not the case that John understood something.

b. It's not the case that John understood anything.

In fact, it is a primary goal of this article to show that despite numerous and compelling appearances to the contrary, *some* and *any* are indeed in complementary distribution in the specific sense that they cannot be licensed[3] on the same constituent. I emphasize the term *constituent*, as the theory developed herein shows that constituents are checked for the acceptability of the Polarity Items (PIs) they contain, and that this checking procedure is recursive. I call 'domain' of a PI a constituent upon which its licensing is evaluated: not all domains of a PI are domains on which it is acceptable, but in order to be licensed, a PI must be acceptable on at least one domain. Licensing occurs once such a domain is found; *some* and *any* cannot be licensed on the same domain but can surface in the same position, albeit through different derivational histories.

I will follow—and substantiate—the generally accepted view that polarity items are sensitive to some semantic property: it is standardly assumed, at least for NPIs, that

[3]In this article, I use the term *license* for NPIs and PPIs alike, and in so doing, I depart somewhat from standard usages which reserve the term *license* for NPIs. In my usage, *license* means 'mark as grammatical'; to be licensed, a PI must be acceptable on some constituent (further conditions apply, which are analyzed in this article); once a PI is licensed, it can no longer be unlicensed.

this property is a generalized notion of negativity, namely downward-entailingness, the capacity to reverse the direction of entailments.[4] My claim that PIs are sensitive to the monotonicity of the constituents they find themselves in might seem trivial, as it follows naturally from the popular assumption that negativity and generalized notions thereof are operative in the acceptability of PIs, but many researchers prefer to view licensing in terms of a structural relation between a PI and an operator equipped with certain features (negativity and downward-entailingness are seen, in this strand of theories, as features); in that sense, the actual logico-semantic properties of syntactic environments are deemed immaterial by those researchers. In a word, this article is a defense of a conservative view, where monotonicity w.r.t. a PI is the controlling factor of its licensing.

The structure of the article is the following. Section 2.2 shows that the monotonicity of environments, i.e. of constituents, is the property that PIs are sensitive to (the evidence comes from cases of so-called flip-flop, i.e. cases where the addition of a downward-entailing expression licenses (anti-licenses) a PI which would be anti-licensed (licensed) without it): this fact is established for NPIs and PPIs alike. In section 2.3, I bring to light novel data about the relations between PIs and show that a PI can only be licensed on a given domain if the other PIs contained in that domain are licensed within it: this is what I call 'dependency'. Section 2.4 further substantiates this claim: it deals with the monotonicity disruption caused by scalar implicatures, and it uses the various loci of interpretation of the PPI *must* as an indicator that the licensing of a PPI can be checked on various constituents; this section also establishes that PPIs of the *some*-type are anti-licensed in the complement of the environments where NPIs of the *any*-type are licensed. The cyclic procedure that this article shows to be at work is analyzed in detail in section 2.5. Given that *some* can only be licensed

[4] I do not discuss alternative proposals which don't rely on downward-entailingness, such as Linebarger 1980 and Giannakidou 2002.

in the environments where *any* is anti-licensed and vice versa, the way is paved for a unification of the PPI and the NPI phenomena (section 2.6): I propose that the latter reduces to the former, i.e. that NPIs are just PPIs licensed by modification in hostile environments. The next two sections argue against other accounts (some hypothetical in 2.7, others real in 2.8). The last section (2.9) deals with some problems that the article leaves open.

2.2 Reviving Flip-flop

In this section I lay the groundwork for the rest of the article. To clarify the discussion, I am going to distinguish two kinds of approaches, the operator-based one and the environment-based one.

1. Hypothesis 1 (H1): The operator-based approach: the acceptability of a given PI π depends on a structural relationship between π and an operator, e.g. negation, i.e. the bearer of a negative feature. This hypothesis is disqualified in section 2.2.2.1.

2. Hypothesis 2 (H2): This is the environment-based approach, which takes the controlling factor of the acceptability of PIs to be the monotonicity (upward vs. downward-monotonicity) of their syntactic environment w.r.t. them.

The evidence against H1 and in favor of H2 comes from flip-flop with all kinds of PIs (weak and strong NPIs, PPIs).

2.2.1 Operators or Environments?

Any can occur in the scope of negation and of a number of other expressions. A prominent idea since the mid-seventies (i.e. since work by Fauconnier (1975, 1978)

and Ladusaw (1979, 1980)) is that NPI licensing expressions share the property of reversing the direction of entailment in their argument. Since these arguments need not be of type <t>, we need a generalized notion of entailment:

(3) **Cross-Categorial Entailment (⇒)**

a. For p, q of type <t>: p ⇒ q iff p = 0 or q = 1.

b. For *f*, *g* of type <σ, t>: *f* ⇒ *g* iff for all x of type σ: *f*(x) ⇒ *g*(x).

Next, we can define downward-entailingness as follows:

(4) A function *f* of type <σ, t> is downward-entailing (DE) iff for all x, y of type σ such that x ⇒ y: *f*(y) ⇒ *f*(x).[5]

Negation is a DE function; the determiner *at most three* is a DE function too (as we verify for its right argument):

(5) a. ⟦ red car ⟧ ⇒ ⟦ car ⟧

b. At most three people own a car ⇒ At most three people own a red car.

Under the standard DEness-based account, *any* is only acceptable (in other words is licensed) in a given sentence *S* if it is in the syntactic scope of a DE function (this condition holds at LF):

(6) **Fauconnier-Ladusaw's Licensing Condition:** An NPI is only grammatical if

[5]Similarly, we define upward-entailingness:

(i) A function *f* of type <σ, t> is upward-entailing (UE) iff for all x, y of type σ such that x ⇒ y: *f*(x) ⇒ *f*(y).

it is in the scope of an α such that $[\![\alpha]\!]$ is DE.

The condition correctly predicts that *any* is licensed in the nuclear scope of *at most three:*

(7) At most three people understood anything.

The operator-based account of licensing is widely accepted (von Fintel 1999, Guerzoni 2006, Szabolcsi 2004, Gajewski 2009 a.o.). On this view, downward-entailingness is a characteristic property of a class of expressions in the scope of which weak NPIs are licensed; this doesn't mean—this distinction is important but is not always made explicitly—that downward-entailingness itself is operative in licensing. In other words, operator-based licensing is not tied up with entailment reversal in the position of the NPI: it only commits itself to a structural relationship between an item and an operator (a natural way to think about this is in terms of agreement; Guerzoni (2006) fully endorses this perspective, and claims that weak NPIs check an NPI feature with a licenser either by feature movement or by QR).

Gajewski (2005) proposes an alternative DEness-based account, whereby syntactic constituents themselves can be DE:

(8) A constituent A is DE with respect to the position of α ($[\![\alpha]\!] \in D_\sigma$) iff the function $\lambda x.[\![\ A[\alpha/v_\sigma]\ ]\!]^{g[v_\sigma \to x]}$ is DE.[6]

[6]We straightforwardly define upward-entailingness for constituents:

(i) A constituent A is UE with respect to the position of α ($[\![\alpha]\!] \in D_\sigma$) iff the function $\lambda x.[\![A[\alpha/v_\sigma]]\!]^{g[v_\sigma \to x]}$ is UE.

Gajewski replaces the operator-related requirement by the requirement that *any* appear at LF in an environment that supports downward entailments (I will henceforth refer to accounts which require DEness of syntactic environments as environment-based accounts).

(9) **Environment-related Licensing Condition (after Gajewski 2005):** An NPI α is licensed in sentence *S* only if there is a constituent A of *S* containing α such that A is DE w.r.t. the position of α.

This move makes room for NPIs licensed by a combination of expressions which, without denoting DE functions themselves, create a DE environment (as argued for e.g. in Heim 2003 about NPIs in *than*-clauses); it also takes into account the potential disruptive effect of expressions whose presence in the same constituents as the NPI might disrupt its licensing by interfering with the downward-monotonicity of the constituents in question.[7] The reader might have noticed that the licensing condition encompasses an existential quantification: this is because checking the licensing of *any* globally (i.e. on the maximal constituent containing the NPI) makes incorrect predictions with regard e.g. to the following sentence:

(10) It is not possible that John didn't understand anything.

The whole sentence (10) is upward-entailing (the two negations cancel each other out) w.r.t. the position of the NPI *anything.* Yet the NPI is licensed. Similarly, the co-occurrence of the DE-function denoting expression *at most five* and of *n't* creates a UE environment. But *anything* is licensed:

[7]The disruptors I have in mind are scalar implicatures, cf. Chierchia 2004 and section 2.4 of this article, as well as presuppositions, cf. Homer 2010d, Chapter 3 of this dissertation.

	tie?	color?	
α	yes	yellow	no red tie
β	yes	black	
γ	yes	black	
δ	yes	black	
ε	yes	pink	
ζ	yes	black	
η	yes	blue	
θ	yes	black	
ι	yes	black	
κ	yes	yellow	
λ	no	—	no tie
μ	no	—	
ν	no	—	

	tie?	color?	
α	yes	red	
β	yes	red	
γ	yes	red	
δ	yes	red	
ε	yes	red	
ζ	yes	red	
η	yes	red	
θ	yes	red	
ι	yes	red	
κ	yes	yellow	no red tie
λ	no	—	no tie
μ	no	—	
ν	no	—	

Table 2.1: Intuitive Verification of DEness

(11) At most five people didn't understand anything.

To see that the global environment created by the composition of the two DE functions is UE, suppose that at most 5 people are not wearing a tie, as illustrated in the left-hand side Table 2.1 (the domain contains 13 people); it doesn't follow that at most 5 people are not wearing a red tie ($[\![\text{red tie}]\!] \Rightarrow [\![\text{ tie }]\!]$), therefore the context is not DE. Whenever at most 5 people are not wearing a red tie, as illustrated in the right-hand side Table 2.1, at most 5 people are not wearing a tie: the context is UE.

In order for the environment-related approach to be empirically adequate, the licensing condition cannot require that *any* be licensed on the maximal constituent. It must require that it be licensed on *some* constituent, in other words that there be some constituent which is DE w.r.t. the position of the NPI.

The observation of sentences such as (10) has prompted the near consensus that the presence of two DE expressions can never give rise to flip-flop: we know that NPIs can be licensed when they are outscoped by one (or an odd number of) DE expression(s), but it doesn't seem that they are anti-licensed when they are outscoped

by an even number of DE expressions. Put differently, it is generally assumed that evenness doesn't matter to the licensing of NPIs.

The claim that I defend in this article runs counter to this consensus: I argue that flip-flop does exist. However it is hard to detect since an NPI only needs to be acceptable in one constituent. Cases where flip-flop emerges are cases in which some constraint imposes that the licensing of the NPI be checked on some constituent which fails to be DE w.r.t. the NPI (due to the presence of an even number of DE expressions).

From an operator-based perspective, flip-flop is a rather obscure notion. Grammar normally doesn't count, i.e. there are no known instances where grammaticality is determined by a number, e.g. the number of occurrences of a given item.

The environment-based approach is best suited to account for flip-flop, as it naturally takes into account the contribution of all the expressions in the syntactic context of a polarity item. It also derives in a straightforward way the disruption effects caused by certain expressions which co-occur with the NPI. In the next section, I present evidence for the first of the two phenomena, namely flip-flop (the second phenomenon, disruption, is dealt with in section 2.4.1) and I examine the following formulation of the environment-based hypothesis:

> <u>Hypothesis 2a (H2a):</u> <u>Global acceptability:</u> In order for PI π to be acceptable (therefore licensed) in sentence *S*, *S* must have the appropriate monotonicity w.r.t. the position of π.

This hypothesis is immediately challenged by (2) (a PPI and an NPI are equally acceptable in the same position) and I complete the case against it in the next section.

2.2.2 Flip-flop with Weak NPIs

2.2.2.1 French Weak NPIs

In this article, I mainly deal with weak NPIs (with the exception of section 2.2.3). I use the term *weak*, as everybody else in the literature, to refer to polarity items that appear in a relatively large number of contexts. *Strong* NPIs (i.e. (i.) strict NPIs e.g. *in years, yet, either* and (ii.) minimizers e.g. *a red cent*) are licensed in a proper subset of the contexts where weak NPIs are licensed: for example, they are not licensed in the scope of strictly DE expressions such as *at most five people.* In this article I want to keep the terms *weak* and *strong* as theory-neutral as possible (as it is not clear at this stage what underlies this weak-strong distinction) and use them in a relative sense.

No French NPIs appear in more contexts than *[wh-phrase] que ce soit, quelque NP que ce soit* and *quiconque*:[8] therefore they jointly form the category of French weak NPIs, per the convention I'm following.

It is sometimes claimed that minimizers (e.g. *lift a finger, sleep a wink, bat an eyelash, a single thing,* etc.) are not genuine NPIs, and that their distribution reflects the demands of the presupposition of a hidden *even* co-occurring with them, rather than the desiderata of the items themselves. With well-accepted NPIs e.g. *ever* and *any* on the other hand, it seems clear that there is something intrinsic to their meaning or their syntactic features that governs their distribution. I will not try to settle this question in this article. My strategy is the following: I will study weak and strong NPIs (including minimizers), but separately. Minimizers deserve to be included in this investigation as they are subject to flip-flop (2.2.3), which indicates that grammar checks their acceptability on constituents (the ultimate target of licensing is irrelevant

[8]These three items or templates of items have some obvious morphological family resemblance. I touch upon it in section 2.6.

to us).

We can show that *[wh-phrase] que ce soit* is not a minimizer, and therefore is instructive about weak NPIs. There are two tests that serve to detect minimizers (also known as *even*-NPIs): they can be associated with an overt *even* (Rullmann 1996) and they give rise to a negative bias in yes-no questions (Ladusaw 1979, Heim 1984, Guerzoni 2003, 2004):

(12) (Did John do something to help?)

a. No, not even [a single thing]$_F$.

b. *No, not even anything$_F$.

(13) a. Did John do a single thing to help?

Expected answer: he didn't.

b. Did John do anything to help?

No negative bias.

By those two criteria, *quoi que ce soit* is not a minimizer:

(14) (Did Jean do something to help?)

a. *Non, pas même [le plus petite chose]$_F$.*
no NEG even the most small thing

b. **Non, pas même [quoi que ce soit]$_F$.*
no NEG even what that this be.SUBJ

(15) a. *Jean a-t- il fait la plus petite chose pour aider ?*
Jean has he done the most small thing to help
'Did Jean do a single thing to help?'

Expected answer: he didn't.

b. *Jean a-t- il fait quoi que ce soit pour aider ?*
Jean has he done what that this be.SUBJ to help
'Did Jean do anything to help?'

No negative bias.

The functions that create licensing contexts for *quoi que ce soit* are the same as for English weak NPIs *any* and *ever:* i.e. they are DE-function denoting expressions. Negation is the prototypical DE function:[9]

(16) a. **Jean a critiqué quoi que ce soit.*[10]
Jean has criticized what that this be.SUBJ

b. *Jean n' a pas critiqué quoi que ce soit.*
Jean NEG has NEG criticized what that this be.SUBJ

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[9]For some speakers, including me, (16b) is not optimal, but it improves with a modification by a relative clause:

(i) *Jean n' a pas critiqué quoi que ce soit de ce que j' ai dit.*
Jean NEG has NEG criticized what that this be.SUBJ of this that I have said
'Jean didn't criticize anything I said.'

What seems to be the problem for those speakers is that *quoi que ce soit* dislikes clausemate negations, as it is perfectly acceptable in the scope of a superordinate negation (18). The fact that modification improves *wh-phrase que ce soit* significantly suggests that it is sensitive to what goes by the name of *subtrigging*, which refers to the licensing of an item by modification, cf. LeGrand 1975, Dayal 2004 and section 2.6. Although it poses what looks like a 'doughnut' problem, I will use *[wh-phrase] que ce soit* throughout my examples, because unlike *le moindre* ('the slightest')—which has superficially the same distribution—it has no appearance of belonging to the category of minimizers.

Notice that negation in French can be expressed using two negative markers, *ne* and *pas*, which I gloss as NEG. Only *pas* is necessary.

[10]Here I am describing the dialect of European French that I and my consultants are native speakers of. In a recent article, Francis Corblin (2010) describes what appears to be another dialect, in which *quoi que ce soit* doesn't need a downward-entailing environment: it is licit under non negated *critiquer* 'criticize' (see the article for details).

(i) a. *Jean mange quoi que ce soit.
b. Jean critique quoi que ce soit.

In my dialect (ia) and (ib) are both completely impossible.

The DE expressions in the scope of which *quoi que ce soit* (like English *any*) is licensed include negative quantifiers (over individuals and times) and DE determiners. It is also licensed in antecedents of conditionals and yes-no questions:

(17) a. *Jean n' a jamais critiqué quoi que ce soit.*
Jean NEG has ever criticized what that this be.SUBJ

b. *Personne n' a critiqué quoi que ce soit.*
nobody NEG has criticized what that this be.SUBJ

c. *Au plus cinq personnes ont critiqué quoi que ce soit.*
at most five people have criticized what that this be.SUBJ

d. *Jean critique rarement quoi que ce soit.*
Jean criticizes rarely what that this be.SUBJ

e. *Si tu critiques quoi que ce soit, tu seras renvoyé.*
if you criticize what that this be.SUBJ you be.FUT fired

f. *A-t- il critiqué quoi que ce soit ?*
has he criticized what that this be.SUBJ

Downward-entailingness can be provided by a superordinate negation (18a)-(18b) or by an embedding verb (18c):

(18) a. *Il n' est pas possible que Jean ait critiqué quoi que ce soit.*
it NEG is NEG possible that Jean have.SUBJ criticized what that this be.SUBJ
'It is not possible that Jean criticized anything.'

b. *Je ne prétends pas que Jean ait critiqué quoi que ce soit.*
I NEG claim NEG that Jean have.SUBJ criticized what that this be.SUBJ
'I don't claim that Jean criticized anything.'

c. *Marie dément que Jean ait critiqué quoi que ce soit.*
Marie denies that Jean have.SUBJ criticized what that this be.SUBJ
'Marie denies that Jean criticized anything.'

The DE function can be separated from the licensee by more than one layer of embedding:

(19) *Il est impossible que Marie pense que Jean ait critiqué quoi que*
it is impossible that Marie thinks that Jean have.SUBJ criticized what that
ce soit.
this be.SUBJ
'It is impossible that Marie thinks that Jean criticized anything.'

By itself, the latter fact might suggest that locality plays no role in licensing. However, a closer inspection reveals that the opposite is true.

To show this, I propose that we place an NPI in the scope of two DE expressions instead of one. The globalist version of the environment-based approach H2a on p. 21 makes a prediction: it holds that the maximal constituent containing the NPI must be DE w.r.t. its position, therefore the co-occurrence of an even number of DE expressions above the NPI creates an upward-entailing environment in its position, leading to anti-licensing. We have seen that the globalist version is too strong (page 19). But there are certain configurations of two DE expressions which have exactly this anti-licensing effect in French (the predicate *impossible* 'impossible' denotes a DE function; it licenses *quoi que ce soit*, as shown in (20)):

(20) *Il est impossible que Jean ait fait quoi que ce soit pour aider*
it is impossible that Jean have.SUBJ done what that this be.SUBJ to help
la Mafia.
the Mafia

(21) **Il n' est pas impossible que Jean ait fait quoi que ce soit*
it NEG is NEG impossible that Jean have.SUBJ done what that this be.SUBJ
pour aider la Mafia.
to help the Mafia

So far the French facts are compatible with the hypothesis that licensing of *quoi que ce soit* is computed on the whole sentence, i.e. what I propose to label the 'global licensing' hypothesis (aka global flip-flop). But anti-licensing only obtains when two DE expressions are too 'close', in a sense to be determined. To see this, let us keep the DE predicate *impossible* 'impossible', but let us change the second inducer of DEness from negation into the restrictor of *si* 'if', a yes-no question or a negation in a higher clause. We observe that the NPI is licensed:

(22) a. S'il est impossible que Jean ait fait quoi que ce soit pour aider la Mafia, je lui présenterai mes excuses.
'If it is impossible that Jean did anything to help the Mafia, I will apologize to him.'

b. Est-il impossible que Jean ait fait quoi que ce soit pour aider la Mafia ?
'Is it impossible that Jean did anything to help the Mafia?'

c. Non pas qu'il soit impossible que Jean ait fait quoi que ce soit pour aider la Mafia.
'Not that it is impossible that Jean did anything to help the Mafia.'

Likewise, adding a DE-function denoting expression to the embedding verb *démentir* 'deny' (which denotes a DE function and licenses NPIs on its own, cf. (18c)) can lead to anti-licensing:

(23) *Context:* Jean is being accused of having connections with the Mafia. Neither the speaker nor the addressee has any certainty about the facts. His wife Marie is being interrogated and so far, she refuses to answer the questions about her husband's alleged mob connections. . . [11]

**Pour le moment, Marie ne dément pas que Jean ait fait quoi*
for the moment Marie NEG denies NEG that Jean have.SUBJ done what
que ce soit pour aider la Mafia.
that this be.SUBJ to help the Mafia

[11] This situation is set up in this particular way because I want to control for the potential interference of a semantic strengthening phenomenon, whereby [not deny that *S*] is reanalyzed as [admit that *S*].

'So far, Marie doesn't deny that Jean did anything to help the Mafia.'

(24) (Same context except that all the people being interrogated refuse to answer the questions about Jean's alleged mob connections. . .)

**Pour le moment, personne ne dément que Jean ait fait quoi que*
for the moment, no one NEG denies that Jean have.SUBJ done what that
ce soit pour aider la Mafia.
this be.SUBJ to help the Mafia
'So far, no one denies that Jean did anything to help the Mafia.'

If we keep the DE verb *démentir* 'deny' but change the second inducer of DEness from negation into the restrictor of *si* 'if', *aucun* 'no', a yes-no question, or a negation in a higher clause, we observe that the NPI is licensed:

(25) a. Si Marie dément que Jean ait fait quoi que ce soit pour aider la Mafia, elle ment.
'If Marie denies that Jean did anything to help the Mafia, she is a liar.'

b. Aucun avocat qui dément que Jean ait fait quoi que ce soit pour aider la Mafia n'est sincère.
'No lawyer who denies that Jean did anything to help the Mafia is sincere.'

c. Marie dément-elle que Jean ait fait quoi que ce soit pour aider la Mafia ?
'Does Marie deny that Jean did anything to help the Mafia?'

d. Non pas que Marie démente que Jean ait fait quoi que ce soit pour aider la Mafia.
'Not that Marie denies that Jean did anything to help the Mafia.'

Therefore the global licensing hypothesis, which appeared to be inadequate for English, cannot be maintained for French either. A natural interpretation of the above two contrasts ((i.) between (21) and (22); (ii.) between (23)-(24) and (25)) is that licensing is indeed checked on constituents, but the nature of the eligible constituents (therefore their size) is not arbitrary. Going back to the ungrammatical (21) and (23),

the NPI is anti-licensed, which means that it finds no constituents which are DE w.r.t. its position. Recall that I use the term 'domain' to refer to a constituent upon which the licensing of an NPI is checked; I will say that NPI α has at least one DE (or UE) domain in sentence *S* to mean that there is at least one constituent of *S* which is DE (UE resp.) w.r.t. the position of α. In the embedded clause of (21) and (23), *quoi que ce soit* has no DE domain. There is however one constituent of the sentence which provides the desired context, namely the main VP. The data allow us to hypothesize that VP is not an eligible domain—i.e. not an eligible constituent for the purposes of the checking of licensing—of *quoi que ce soit.* It appears—this is simply a fact, that nothing yet allows us to derive—that licensing has to be checked on a constituent which cannot be smaller than PolP, for negation is necessarily included in the smallest possible domain. Notice that I use the term PolP (Polarity Phrase) instead of the more common NegP: I assume that positive sentences contain a PolP too; the operator that sits in the specifier of this phrase determines the polarity of the clause, positive vs. negative.[12] Although PolP is an eligible constituent, we don't know (yet) whether the smallest possible domain of *quoi que ce soit* is not in fact larger than PolP. If we trust that (i.) the environment-related approach is correct, (ii.) speakers are infallible at computing the monotonicity of contexts with more than one DE function in them and (iii.) *au plus cinq personnes* 'at most 5 people' sits in Spec,TP in (26), then we must say that the smallest possible domain of *quoi que ce soit* is smaller than TP: if it were not, then the DE quantifier *au plus cinq personnes* would necessarily co-occur with negation in the smallest possible domain of the NPI, leading to anti-licensing.

[12]There is no decisive evidence that negation is a head that attaches to the spine of the sentence rather than a phrase sitting in the specifier of a Pol head.

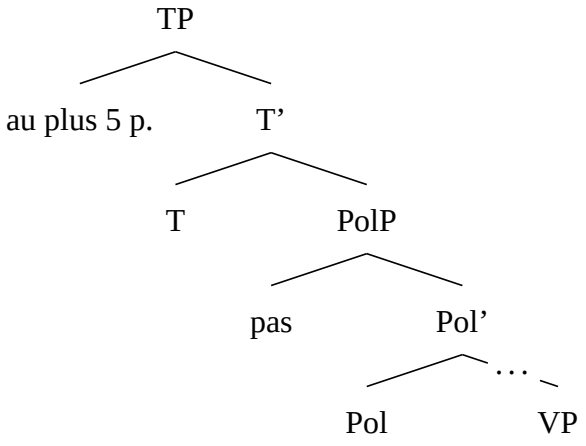
I assume that there is only one negation per clause, and that it cannot move; I further assume that the morphemes *not* and *n't* are not necessarily the spell-outs of negation itself, but instead markers which agree with the actual (silent) negation, therefore their surface position may not be an indication of where negation is interpreted.

(26) *Au plus cinq personnes démentent que Jean ait fait quoi que ce*
at most five people deny that Jean have.SUBJ done what that this
soit pour aider la Mafia.
be.SUBJ to help the Mafia
'At most five people deny that Jean did anything to help the Mafia.'

The NPI has an eligible DE domain in (27): this confirms (i.) that PolP is a subconstituent of TP and (ii.) that it can be the smallest possible domain of *quoi que ce soit.* I will from now on assume that it is.

(27) *Au plus cinq personnes n' ont pas fait quoi que ce soit pour*
at most five people NEG have NEG done what that this be.SUBJ to
aider la Mafia.
help the Mafia
'At most five people didn't do anything to help the Mafia.'

(28)



This is a highly simplified representation of clausal architecture; but I will assume that it is correct. On any given clause γ, the subconstituents of PolP, to the exclusion of subconstituents contained in clauses embedded under γ, are not accessible to the system that checks for the acceptability of *quoi que ce soit:* this explains why the presence of exactly two DE expressions in a superordinate PolP (21) anti-license it.

Against the backdrop of the assumptions defended here, the fact that (24) (repeated

as (29) below) is ungrammatical, indicates that negative quantifiers are interpreted within PolP.

(29) *Pour le moment, personne ne dément que Jean ait fait quoi que ce soit pour aider la Mafia.

This assumption is in line with the conclusion (Jacobs 1980, Ladusaw 1992, Geurts 1996, de Swart 2000, Zeijlstra and Penka 2005, Penka 2007, Iatridou and Sichel 2008), inspired by cases of so-called Neg-split reading in Dutch, German and English,[13] that 'negative quantifiers' spell out negation and an existential quantifier in its scope. In other words, the negative element in a negative quantifier is no other than negation (what is often referred to as sentential negation).

Given the anti-licensing brought about by two DE expressions in PolP in French, I modify the environment-related licensing condition (9) slightly:

(30) **Environment-related Licensing Condition (modified):** An NPI α is licensed in sentence *S* only if there is an *eligible* constituent A of *S* containing α such that A is DE w.r.t. the position of α.

[13]With a modal verb (a quantifier over possible worlds) negative quantifiers give rise to so-called Neg-split whereby the negative component is interpreted above the modal, while the restriction is interpreted below it:

(i) a. *Ze mogen geen eenhoorn zoeken.*
they are allowed no unicorn seek
(Dutch; Rullmann 1995, cited in Iatridou and Sichel 2008)
b. There is no unicorn x such that they are allowed to seek x. (wide scope)
c. What they are allowed to do is seek no unicorn. (narrow scope)
d. They are not allowed to seek a unicorn. (split scope)

(ii) No doctor has to be present.
a. There is no doctor x such that x has to be present. (wide scope)
b. It is not required that a doctor be present. (split scope)

The contrasts observed above are now explainable. There are two PolPs in (21) (likewise in (23)); but both are UE w.r.t. the position of *quoi que ce soit:* the larger one because it contains both the predicate *impossible* and negation, the smaller one because it contains no DE expression. In (22) (likewise in (25)), the two DE expressions are not contained in all the same PolPs: the smaller PolP, which contains only one DE expression, provides a DE context and is therefore favorable to *quoi que ce soit.* Now consider (31), where two PolPs are again available.

(31) a. Il est impossible que Jean n'ait pas fait quoi que ce soit pour aider la Mafia.
'It is impossible that Jean didn't do anything to help the Mafia.'

b. *Context:* Jean claims that he didn't do anything to help the Mafia; his wife Marie, who will do anything to send him to jail, testifies against him…
Marie dément que Jean n'ait pas fait quoi que ce soit pour aider la Mafia.
'Marie denies that Jean didn't do anything to help the Mafia.'

The NPI is licensed in the scope of two DE functions if one is in the superordinate clause while the other is a clausemate: this indicates that its licensing can be checked on the smaller PolP, which contains a negation. On the larger PolP, the NPI is anti-licensed, for the same reason that it is anti-licensed in (21) and (23)-(24). Since there is at least one favorable eligible domain (embedded PolP), the NPI ends up licensed. Let us sum up the observations about (21), (22a), and (31a) in the LFs below. A word about notation: the label YP ↗x used in the representation of logical forms indicates that YP is UE w.r.t. the position where the bearer of index *x* is interpreted; YP ↘x indicates that YP is DE w.r.t. the position where the bearer of index *x* is interpreted.[14]

[14]Caveat: several objects might share the same index (due to the existence of traces), but the position that the labels target is the position where the object gets effectively interpreted.

(32) a. (21): *[$_{TP}$ T [$_{\boxed{PolP}\boxed{\nearrow 1}}$ **pas impossible** [$_{CP}$ que Jean T [$_{\boxed{PolP}\boxed{\nearrow 1}}$ [quoi que ce soit]$_1$ faire t$_1$]]]]

b. (22a): [$_{\boxed{TP}\boxed{\nearrow 1}}$ [$_{\boxed{CP}\boxed{\nearrow 1}}$ **Si** T [$_{\boxed{PolP}\boxed{\searrow 1}}$ **impossible** [$_{CP}$ que Jean T [$_{\boxed{PolP}\boxed{\nearrow 1}}$ [quoi que ce soit]$_1$ faire t$_1$]]]] T]

c. (31a): [$_{\boxed{TP}\boxed{\nearrow 1}}$ T [$_{\boxed{PolP}\boxed{\nearrow 1}}$ **impossible** [$_{CP}$ que Jean T [$_{\boxed{PolP}\boxed{\searrow 1}}$ **pas** [quoi que ce soit]$_1$ faire t$_1$]]]]

Let us now consider a case with three DE expressions. Our hypothesis rightly predicts that *quoi que ce soit* is licensed in (33), because both the larger and the smaller PolP provide a DE context for *quoi que ce soit* (each contains an odd number of DE expressions above the NPI):

(33) Il n'est pas impossible que Jean n'ait pas fait quoi que ce soit pour aider la Mafia.
'It is not impossible that Jean didn't do anything to help the Mafia.'

(34) [$_{\boxed{TP}\boxed{\searrow 1}}$ T [$_{\boxed{PolP}\boxed{\searrow 1}}$ **pas impossible** [$_{CP}$ que [$_{TP}$ Jean T [$_{\boxed{PolP}\boxed{\searrow 1}}$ **pas** [quoi que ce soit]$_1$ faire t$_1$]]]]]

Lastly, our hypothesis predicts that *quoi que ce soit* is acceptable in (35) because it is in a DE environment in the entire sentence (due to an odd number of DE expressions in that constituent). The sentence is fairly hard to judge, therefore it is imprudent to build much on it. It seems clear however that it is better than (21), in which all eligible domains that contain the NPI are UE w.r.t. its position.

(35) *Non pas qu' il ne soit pas impossible que Jean ait fait*
NEG NEG that it NEG be.SUBJ NEG impossible that Jean have.SUBJ done
quoi que ce soit pour aider la Mafia.
what that this be.SUBJ to help the Mafia

(36) [$_{\boxed{\text{TP}\ \searrow 1}}$ [$_{\boxed{\text{PolP}\ \searrow 1}}$ **pas** [$_{\boxed{\text{CP}\ \nearrow 1}}$ [$_{\text{TP}}$ T [$_{\boxed{\text{PolP}\ \nearrow 1}}$ **pas impossible** [$_{\text{CP}}$ que [$_{\boxed{\text{TP}\ \nearrow 1}}$ Jean T [quoi que ce soit]$_1$ faire t$_1$]]]]]]]

To conclude this section on French weak NPIs, there is evidence that certain weak NPIs are sensitive to the monotonicity of their syntactic environments; the evidence comes from configurations where two DE expressions co-occur in PolP, giving rise to flip-flop.[15] The data support the hypothesis that an NPI is licensed only if it is acceptable in some eligible constituent. We can now discard the operator-based approach (H1 on p. 16), as it is not suited to account for flip-flop. The globalist version of the environment-related approach (H2a on p. 21) is also disqualified.

2.2.2.2 English Weak NPIs

The French facts are—to some extent only—replicated in English. There are clear cases where for some speakers, *any* is anti-licensed due to flip-flop, e.g. (37b).[16]

(37) a. It is impossible that John did anything to help the Mafia.

b. %It is not impossible that John did anything to help the Mafia.

c. Not that it is impossible that John did anything to help the Mafia.

(37b) and (37c) form a pair that confirms the prediction of the environment-related approach relativized to eligible constituents: both sentences contain two DE expressions outscoping the NPI, but they differ in the position of the negation: while *not* and *impossible* are contained in all the same PolPs in (37b), there is a PolP in (37c) which

[15]Thus far, we have no explanation for the existence of what we have described as a smallest possible domain of the NPI. Let us assume that this is a lexical requirement.

[16]Similar facts are noted in passing by Schueler (2005): the dialect he describes is obviously the one I label dialect B below.

contains one and not the other. Similarly with the verb *doubt:*

(38) a. I doubt that John did anything to help the Mafia.

b. %I don't doubt that John did anything to help the Mafia.[17]

c. %No one doubts that John did anything to help the Mafia.

d. Not that I doubt that John did anything to help the Mafia.

The evidence is mixed for the existence of domains of NPIs in English, since there seem to be two dialects, one that accepts (37b), (38b) and the like (dialect A), and one (dialect B) which rejects them. But it is natural to assume that the unacceptability of (37b) (and (38b)) is incompatible with operator-related licensing (H1). In order to explain the variation about (37b) and (38b), I propose that in the dialect of the speakers who accept those sentences, the smallest possible domain of *any* is smaller than the smallest possible domain of *any* in the dialect which rejects them (and also smaller than the smallest possible domain of *quoi que ce soit*). In the former dialect, this domain can be VP, but it can actually be arbitrarily small. Suppose indeed that any constituent qualifies as a domain for *any:* then there is at least one eligible constituent which is DE w.r.t. the position of *anything* in (37b) and (38b), namely matrix VP.[18]

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[17]A semantic strengthening usually takes place with the verb *doubt: 'John doesn't doubt that p'* is usually not interpreted literally, rather, it is taken to mean that John is certain that p. Even when strengthening is neutralized, the NPI is anti-licensed for the speakers who reject (38b):

(i) %I don't particularly doubt that John did anything to help the Mafia.

[18]Notice that *any* is licensed under negated *deny:*

(i) a. So far, Mary denies that John did anything to help the Mafia.
b. So far, Mary doesn't deny that John did anything to help the Mafia.

Unsurprisingly, *any* is also licensed when the two DE expressions are not in all the same PolPs.

(ii) Not that Mary denies that John did anything to help the Mafia.

Summing up, flip-flop does occur with English weak NPIs. The lack of flip-flop in one dialect doesn't invalidate the environment-approach, because it is possible that in that dialect the smallest possible domain of *any* is smaller than in other dialects (or even arbitrarily small).

2.2.3 Flip-flop with Strong NPIs

The claim made in this article that flip-flop exists in English is not unprecedented, but it was made using strong NPIs. As far as I know, Schmerling (1971) was first to provide evidence for it (*a thing* is an NPI of the minimizer kind):[19]

(39) a. *There was someone at the scene of the accident who did a thing to help.
b. There wasn't anyone at the scene of the accident who did a thing to help.
c. There was someone at the scene of the accident who didn't do a thing to help.
d. *There wasn't anyone at the scene of the accident who didn't do a thing to help. [Schmerling 1971, ex. 14]

(40) a. There was no one in the huge lecture hall who uttered a peep when the distinguished linguist suggested that post-Bloomfieldian structuralist phonology and the theory presented in *The Sound Pattern of English* were notational variants.
b. *There was no one in the huge lecture hall who didn't utter a peep when the distinguished linguist suggested that post-Bloomfieldian structuralist

This is an interesting puzzle: even in the dialect in which *any* has a smallest possible domain at least as large as PolP, the NPI is licensed under negated *deny.* The most promising avenue to account for this fact seems to be that *deny* is ambiguous and can mean *make a negative statement about* (and that this ambiguity doesn't exist for French *démentir*). In this sense, it denotes a UE function. The composition of a DE function with a UE function is a DE function.

phonology and the theory presented in *The Sound Pattern of English* were notational variants. [Schmerling 1971, ex. 16]

Oddly enough, it has not been noticed, to the best of my knowledge, that the NPIs that Schmerling used in her examples, e.g. *a thing, a peep,* etc., are strong NPIs, specifically minimizers. This fact is important, as the smallest possible domain of a PI seems to be lexically determined, and we expect to witness different smallest possible domains with different PIs or classes of PIs.

As a matter of fact, the intuitions of the speakers I have polled are not very robust about those sentences which all involve an existential *there*-construction. But they are very clear when it comes to more commonplace embeddings (the speakers of the two dialects I distinguished in section 2.2.2.2 on p. 34 agree):

(41) a. It's impossible that John did a single thing to help the Mafia.
b. *It's not impossible that John did a single thing to help the Mafia.

(42) a. I doubt that John did a single thing to help the Mafia.
b. *I don't doubt that John did a single thing to help the Mafia.

[19]In light of this paradigm (and of the rescuing facts with PPIs), Krifka (1992) builds a theory of PI-licensing whereby an NPI and a DE operator above it form a PPI, and a PPI forms with a DE expression above it an NPI: it is a theory where non-lexical PIs are created recursively. There is a further condition which requires that the result of this recursive PI-formation process is not an NPI: in other words, every sentence that contains a PI must not be a (non-lexical) NPI. This approach can be seen as an implementation of the globalist environment-related approach H2a. Alas, the usual fatal objections carry over: it is not true that a PPI cannot find itself in a global DE environment (witness (ia)) and it is equally false that an NPI cannot find itself in the scope of two DE expressions (witness (ib)).

(i) a. It's impossible that John understands something.
b. It's impossible that John doesn't understand anything.

When the higher DE expression doesn't sit in the same PolP as the embedding verb, the minimizers are acceptable:

(43) a. Not that it is impossible that John did a single thing to help the Mafia.
b. Not that I doubt that John did a single thing to help the Mafia.

Other strong NPIs exhibit the same behavior, for example *yet:*

(44) a. It's impossible that John can understand this yet.
b. *It's not impossible that John can understand this yet.
c. Not that it's impossible that John can understand this yet.

These facts suggest that the acceptability of strong NPIs is not computed on the entire sentence, but rather on smaller constituents (no smaller than PolP). It is natural to extend the proposal defended in this article to those items and claim that their licensing is computed on syntactic domains too, and that not all constituents are eligible for this computation. By the size of their smallest possible domain, they differ from weak NPIs of the A dialect (p. 35).[20]

2.2.4 Flip-flop with PPIs

Positive Polarity Items are another category of items for which there is evidence—although this claim has never commanded a firm consensus—that syntactic domains play a role in the computation of their licensing. While NPIs need to be licensed, PPIs

[20]Note that they also differ from weak NPIs of all dialects by the logical property that they are sensitive too, if standard accounts, which claim that they are sensitive to anti-additivity, are correct (but see Gajewski 2009 for an interesting attempt at dispensing with anti-additivity in natural language). I define anti-additivity on p. 67. Further research is needed to determine whether there is a connection between the strength of a polarity item and the size of its smallest possible domain.

must not be anti-licensed. The indefinite *some* is a PPI because it cannot be interpreted in the scope of a clausemate negation. Note that it is also anti-licensed in the scope of a clausemate negative quantifier e.g. *no one* (the second generalization follows from the first, under the assumption that negative quantifiers are made up of negation and an existential quantifier):

(45) a. When Fred speaks French, Jean-Paul doesn't understand something.
*NEG > SOME

b. When Fred speaks French, no one understands something.
*NEG > SOME

c. When Fred speaks French, Jean-Paul never understands something.
*NEG > SOME

I show in the next two sections that genuine flip-flop exists with PPIs: a DE function undoes the anti-licensing created by another DE function, just like a DE function ruins the licensing created by another DE function in the case of NPIs, cf. (21).

2.2.4.1 No Anti-licensing by a Superordinate Negation

A superordinate negation doesn't anti-license PPIs:

(46) a. I don't claim that when Fred speaks French, Jean-Paul understands something. ✓NEG > SOME

b. It is impossible that when Fred speaks French, Jean-Paul understands something. ✓NEG > SOME

c. No one claims that when Fred speaks French, Jean-Paul understands something. ✓NEG > SOME

d. I never claim that when Fred speaks French, Jean-Paul understands some-

thing. ✓NEG > SOME

The comparison of the above two paradigms (45)-(46) is very suggestive: it suffices that negation be located in a distinct clause for *some* to be licit under it, otherwise it is illicit. Therefore *some* is clearly sensitive to the locality of the potential anti-licenser. The local environment relevant for licensing cannot be arbitrarily small, though. Otherwise *some* would never be anti-licensed, contrary to fact, since it would always be possible to find a constituent A such that *some* occupies the highest terminal node of A and is therefore not c-commanded by negation or by a negative quantifier in A. Therefore not all constituents are eligible for the computation of acceptability. I propose the following provisional condition:

(47) **Licensing Condition of *some:*** *Some* is licensed in sentence *S* only if it is contained in at least one eligible constituent A of S which is not Downward-entailing w.r.t. its position.

This condition bears a striking family likeness to (30). Let us generalize:

(48) **Licensing Condition of Polarity Items *(to be revised):*** A PI π is licensed in sentence *S* only if it is contained in at least one eligible constituent A of S which has the monotonicity properties required by π w.r.t. to the position of π.

We need to determine what constituents are eligible. We know that the smallest possible eligible domain of *some* must contain negation (if the domain approach is correct), otherwise *some* would be licensed under a clausemate negation contrary to fact (cf. (45)): therefore I propose that the smallest possible domain of *some* is PolP. *Some* is

anti-licensed when outscoped by a clausemate negative quantifier (45b) because negation is present in the smallest PolP that contains *some* (recall that we consider negative quantifiers as the spell-out of negation and an existential quantifier). The contrast between (45a) and (46a) is explained away once constituency is taken into account:

(49) a. (45a): *[$_{\boxed{\text{TP}\ \searrow 1}}$ Jean-Paul T [$_{\boxed{\text{PolP}\ \searrow 1}}$ **not** some$_1$ understand t$_1$]]

b. (46a): [$_{\text{TP}}$ T [$_{\boxed{\text{PolP}\ \searrow 1}}$ **not** claim [$_{\text{CP}}$ that [$_{\text{TP}}$ Jean-Paul T [$_{\boxed{\text{PolP}\ \nearrow 1}}$ some$_1$ understand t$_1$]]]]]

The next section provides further evidence that the acceptability conditions of *some* are environment-related. It also furthers our understanding of eligible domains of *some* (evidence is put forward which shows that superconstituents of PolP are eligible domains of *some*).

2.2.4.2 Rescuing

Also consonant with the hypothesis defended here are the cases where the narrow scope of *some* is licit under a clausemate negation if another DE expression outscopes *some*. This is what Szabolcsi (2004) calls 'rescuing'; it is, I submit, genuine flip-flop as the higher DE expression makes available a constituent that is UE w.r.t. the position of the PPI (the facts were already described in Jespersen 1909–1949, Jackendoff 1969):

(50) a. I'm not sure that, when Fred speaks French, Jean-Paul doesn't understand something. ✓NEG > SOME

b. If Jean-Paul doesn't understand something, he has no notion of French at all. ✓NEG > SOME

c. Everyone who doesn't understand something has no notion of French at all. ✓NEG > SOME

d. When Fred speaks French, at most 5 people don't understand something.

✓NEG > SOME

(51) a. (50a): [$_{\boxed{\text{TP}}\boxed{\nearrow 1}}$ I T [$_{\boxed{\text{PolP}}\boxed{\nearrow 1}}$ **not** sure [$_{\text{CP}}$ that Jean-Paul T [$_{\boxed{\text{PolP}}\boxed{\searrow 1}}$ **not** some$_1$ understand t$_1$]]]]

b. (50b): [$_{\boxed{\text{TP}}\boxed{\nearrow 1}}$ [$_{\boxed{\text{CP}}\boxed{\nearrow 1}}$ **if** Jean-Paul T [$_{\boxed{\text{PolP}}\boxed{\searrow 1}}$ **not** some$_1$ understand t$_1$]] he T. . .]

c. (50c): [$_{\boxed{\text{TP}}\boxed{\nearrow 1}}$ [$_{\boxed{\text{DP}}\boxed{\nearrow 1}}$ **everyone** [$_{\text{CP}}$ who [$_{\boxed{\text{PolP}}\boxed{\searrow 1}}$ **not** some$_1$ understand t$_1$]]] T . . .]

d. (50d): [$_{\boxed{\text{TP}}\boxed{\nearrow 1}}$ **at most 5 people** T [$_{\boxed{\text{PolP}}\boxed{\searrow 1}}$ **not** some$_1$ understand t$_1$]]

These data allow us to hypothesize that PolP is not the only kind of constituent that is eligible for the computation of the acceptability of PPIs: larger constituents are eligible. (50a) is not decisive, since it contains at least two constituents which are UE w.r.t. the position of *some*, one of which is a PolP. But (50b), (50c) and (50d) are. In (50b) and (50c) *some* is rescued because it is contained in the restrictor of *if* and *every* respectively, and these are DE environments. Neither *if* nor *every* however is located in a PolP. In (50d), *at most 5 people* doesn't sit in PolP but in Spec,TP: therefore some constituent, at least as large as TP, provides the environment on which the acceptability of *some* is computed successfully.

Let us hypothesize that any superconstituent of (i.e. any constituent which asymmetrically contains) PolP is an eligible constituent but no subconstituent of PolP is eligible; this condition applies to every clause, i.e. in a given clause γ, the system that checks for *some* cannot scan a constituent that is asymmetrically contained in PolP (to the exclusion of clauses embedded under γ). We correctly predict that *some* is not rescued when there are two DE expressions in the superordinate PolP (instead of one, as in e.g. (50a)).

(52) a. It is impossible that John doesn't understand something.

✓n.s. of SOME

b. It is not impossible that John doesn't understand something.[21]

*n.s. of SOME

c. Not that it is impossible that John doesn't understand something.

✓n.s. of SOME

(53) (52b): *[$_{TP}$ T [$_{\boxed{\text{PolP}}\ \boxed{\searrow 1}}$ **not impossible** [$_{CP}$ that John T [$_{\boxed{\text{PolP}}\ \boxed{\searrow 1}}$ **not** something$_1$ understand t_1]]]]

Summary

In our view, rescuing is nothing but flip-flop applied to PPIs. We reach two conclusions: (i.) licensing is computed on syntactic environments (i.e. constituents), (ii.) the

[21]This example is important because other theories, in particular Szabolcsi's (2004), make an opposite prediction: her theory is operator-based, and as such it predicts that constituency doesn't affect licensing. Szabolcsi reports the following judgment (i) (her ex. 70) about a sentence with two DE expressions outscoping a PPI in need of rescuing;

(i) I don't regret that John didn't come up with something. ✓n.s. of SOME

The speakers I polled either disagreed with it or agreed with it but also accepted the benchmark sentence (iia) (for a reason that might have to do with the presence of the particle *up*):

(ii) a. John didn't come up with something. %n.s. of SOME
b. I regret that John didn't come up with something. ✓n.s. of SOME
c. I don't regret that John didn't come up with something. %n.s. of SOME

It bears also saying that narrow scope of *some* in (52b) is rejected by all speakers, even the speakers of A who accept (iii). The discrepancy suggests that the idea that a PPI under a clausemate negation forms a non-lexical weak NPI with negation (as Krifka 1992 and Szabolcsi 2004 have it) is empirically unwarranted.

(iii) It is not impossible that John understands anything.

monotonicity of the constituents w.r.t. the position of PIs is what matters rather than some structural relationship (precisely because flip-flop exists).

Interestingly, the environment-related approach is corroborated by the investigation of the two kinds of PIs, which suggests that there exist deep commonalities between them. The acceptability conditions of *any* and *some* are very similar: it suffices that they are acceptable in some eligible constituent to be licensed. Both the operator-related approach (H1) and the globalist environment-related approach (H2a) are disconfirmed by these data.

In the next section, I continue the exploration of the licensing of PIs and discard another formulation of the environment-based hypothesis, i.e. the hypothesis that licensing of a given PI is done independently of the licensing of other PIs in its domain.

2.3 Dependency

A question that we have left unanswered so far is the following: is the acceptability of a given PI independent from the acceptability of other PIs in the same sentence? This is what I call the 'local and separate acceptability' hypothesis:

> Hypothesis 2b (H2b): Local and separate acceptability: For each PI π in sentence *S*, there is an eligible constituent A such that π is acceptable in A, i.e. A has the appropriate monotonicity w.r.t. the position of π (the condition is restricted by the proviso—motivated by the unavailability of *some* in (1a)—that certain constituents are not eligible for the verification of the acceptability of *some*).

This section shows that this hypothesis is not correct, using novel observations: a PI is only acceptable in a given constituent if all other PIs in that constituent are acceptable *within* that constituent. This fact not only corroborates the existence of domains, it

also reveals the cyclicity of licensing.

2.3.1 Multiple NPIs

Sentences which contain multiple NPIs raise an interesting issue: the following sentence contains two NPIs, one in the embedded clause, the other in the matrix, and the NPIs are separated by a DE expression; it is perfectly grammatical (in abstract representations, I write an NPI as π^- and a PPI as π^+).

(54) a. Mary didn't tell anyone that John didn't do anything to help the Mafia.

b. $[\ldots \textbf{not} \ldots \pi_1^- \ldots [\ldots \textbf{not} \ldots \pi_2^- \ldots]]$

Although *anything* is acceptable on the embedded PolP (PolP1), it is not on the matrix PolP (PolP2) or any superconstituent thereof. The NPI *anyone* on the other hand is only acceptable on superconstituents of the matrix PolP (PolP2).

(55) (54a): $[_{TP}$ Mary T [PolP2 ▼1 ▲2 **not** anyone$_2$ tell t$_2$ $[_{CP}$ that John T [PolP1 ▲1 **not** [anything]$_1$ do t$_1$]]]]

We don't know a priori which of the following two branches of the alternative is correct:

1. Either the system checks the licensing on an item-per-item basis (this is Hypothesis H2b on p. 44). For example, suppose it checks for the licensing of PI π_k; suppose constituent A contains the PIs π_k and π_l; when scanning constituent A, the system only checks the licensing of π_k and ignores π_l; when the licensing of π_l is checked, the licensing of π_k can be ignored (this hypothesis is discarded in section 2.3.2.1);

2. Or the acceptability of PI π in constituent A is contingent upon the acceptability of other PIs in A. This in fact amounts to saying that there exist constraints on the acceptability of constituents themselves (a constituent that contains unacceptable PIs is not acceptable). Hypotheses H2c, H2d and H2e are three possible instantiations of this idea:

   - Hypothesis 2c (H2c): Local and joint acceptability: There is an eligible constituent A of *S* such that A has the appropriate monotonicity w.r.t. the positions of all PIs in *S*;
   - Hypothesis 2d (H2d): Local, dependent, and non-cyclic acceptability: For each PI π in *S*, there is an eligible constituent A of *S* containing π such that π is acceptable in A and every PI π' in A is acceptable in A too;
   - Hypothesis 2e (H2e): Local, dependent, and cyclic acceptability: For each PI π in *S*, there is an eligible constituent A of *S* containing π such that π is acceptable in A and every PI π' in A is licensed *within* A (which means that π' is acceptable in A itself or in some other cycle, i.e. in some subconstituent of A). I show that this hypothesis is correct in 2.3.2.1.

Sentences such as (54a) make a decisive case against the 'local and joint acceptability' hypothesis H2c and the 'local, dependent and non-cyclic' hypothesis H2d. The former (H2c) requires that there be a constituent which has the appropriate monotonicity w.r.t. all PIs, and this is not the case in the impeccable (54a): every constituent which contains both NPIs is UE w.r.t. the position of the lower NPI; the latter hypothesis (H2d) requires that for each PI π, there is a constituent A which has the appropriate monotonicity w.r.t. the position of π and all other PIs in A: if this condition is enforced, then the higher NPI can never be licensed.

The ‘local, dependent and cyclic’ hypothesis H2e on the other hand is empirically adequate. It requires that for each PI π there be a constituent A in which π is acceptable and all other PIs in A are licensed *within* A: this is indeed the case because (i.) the lower NPI can be licensed on the embedded PolP (PolP1); (ii.) the higher NPI can be licensed on the matrix PolP (PolP2) without violating the acceptability condition. When the licensing of the higher NPI is evaluated on PolP2, all that matters is that the lower NPI be licensed *within* PolP2, which is indeed the case (it is licensed on a subconstituent of PolP2): the licensing is cyclic in (54a) because the lower NPI is licensed first, on a subconstituent of the constituent where the higher NPI is subsequently licensed. We are thus left with two hypotheses, H2b and H2e. It is now time to break the tie. This section achieves this goal by producing new data about the interaction of PIs: the licensing of a given PI is indeed *dependent* on the licensing of other PIs in the same sentence. The data therefore substantiate the ‘local, dependent and cyclic’ hypothesis.

2.3.2 Multiple PPIs

Let *S* be a sentence and let *S’* be a sentence embedded in *S*. Both *S* and *S’* contain a negation. To simplify matters, let us first consider cases where there is only one occurrence of *some* in the structure. We know that *some* is licit in the embedded PolP, i.e. under the negation of *S’* (56) (it is rescued).

(56) ✓[$_S$ . . . **not** . . . [$_{S'}$ . . . [**not** . . . some . . .]]]

We predict that *some* is also licit when interpreted higher than the negation of *S’* (if there is no other occurrence of *some* in the structure) since there is at least one constituent where its position is UE, e.g. *S’*.

(57) ✓[$_S$ . . . **not** . . . [$_{S'}$ some . . . **not** . . .]]

The prediction is borne out. *Some* can be interpreted in *S'* higher than negation (if there is no other clausemate occurrence of *some* lower than negation): this is demonstrated by the consistence of the discourse in (58).

(58) a. —A: Everyone is hiding.

b. —B: That's exactly true, it's impossible that someone isn't hiding.

In other words, the licensing of *some* in B's reply is checked on some constituent larger than the embedded PolP but smaller than the matrix PolP, e.g. the embedded TP. *Some* can also be interpreted lower than the negation of *S'* whether it is an *in situ* object as in (50a) or a subject reconstructed under negation. The latter possibility is evidenced by the consistence of the discourse in (59).

(59) a. —A: Someone is hiding.

b. —B: That's exactly true, it's impossible that someone isn't hiding.

The licensing of *some* in (59b), where *some* reconstructs under negation, is checked on a constituent at least as large as the matrix PolP:

(60) a. (58b): [$_{TP}$ T [$_{\boxed{\text{PolP}\ \searrow 1}}$ **impossible** [$_{CP}$ [$_{\boxed{\text{TP}\ \nearrow 1}}$ someone$_1$ T [$_{PolP}$ **not** t$_1$ hiding]]]]]

b. (59b): [$_{TP}$ T [$_{\boxed{\text{PolP}\ \nearrow 1}}$ **impossible** [$_{CP}$ [$_{\boxed{\text{TP}\ \searrow 1}}$ t$_1$ T [$_{\boxed{\text{PolP}\ \searrow 1}}$ **not** someone$_1$ hide]]]]]

The reconstruction of subject *some* under negation is not possible if the landing position is one in which it is not rescued:

(61) Someone isn't hiding. *NEG>SOME

$[\![(61)]\!] \neq \neg\exists x[\text{hide'}(x)]$

2.3.2.1 Two PPIs with Two Negations

Let us now move to a more complex case, in which there is more than one occurrence of *some:* we are going to observe that the presence of a second occurrence of *some* under the negation of *S'* constrains the locus of interpretation of subject *someone* in the same clause. This configuration is represented in (62): every constituent in which the lower *some* is licensed is a superconstituent of the PolP of *S* and is therefore a constituent in which the higher *some* is anti-licensed (it is DE with respect to its position):

(62) $[_S \ldots \textbf{not} \ldots [_{S'}\ \text{some}_2 \ldots [\ \textbf{not} \ldots \text{some}_1 \ldots]]]$

The 'local and separate acceptability' hypothesis H2b predicts that this configuration is perfect: according to it, $some_1$ can be licensed on *S* and $some_2$ can be licensed on *S'*. The 'cyclic acceptability' hypothesis H2e predicts that it is ill-formed. In effect, $some_1$ is not licensed on or within *S';* it cannot be licensed on *S* either—although *S* is UE w.r.t. its position—because $some_2$ is not licensed on or within *S: S* is DE w.r.t. the position of $some_2$, and $some_2$ cannot be licensed on any of the eligible subconstituents, for they are all DE w.r.t. $some_1$. In other words, for each PI, there is no constituent A such that it is acceptable in A and all other PIs in A are licensed within A.

Let us check the predictions. First of all, observe that the narrow scope of *somewhere* in (63a) under negation is excluded (the wide scope is possible but pragmatically odd because it is extremely uninformative): there is no constituent where *somewhere* is acceptable and pragmatically felicitous.

(63) a. #Someone isn't hiding somewhere. *NEG > SOMEWHERE

b. (63a): *[$_{\text{TP}}$ ↘1 ↗2 someone$_2$ T [$_{\text{PolP}}$ ↘1 **not** somewhere$_1$ t$_2$ hide]]

Let us now embed (63a). We obtain a minimal pair: compare (58b) and (64b).

(64) a. —A: Everyone is hiding.

b. —B: #That's exactly true, it's impossible that someone isn't hiding somewhere.[22]

The only difference between (58b) and (64b) is that the latter contains an occurrence of clausemate *some* under negation and is infelicitous: the only possible meaning of B's reply is paraphrasable as *'there has to be someone hiding somewhere'*, which is pragmatically deviant in context since it is weaker than A's assertion: therefore B's declared claim of total agreement is out of place. This indicates that the co-occurrence of two *some* in the embedded clause, one being in the embedded PolP and the other being higher than negation (this configuration would yield the reading *'it is necessary*

[22]Baker (1970) gives the following example (ii) with two PPIs (*someone* and *still*) on either side of the embedded negation. He doesn't notice that the only reading of this sentence is one in which subject *someone* reconstructs under negation. The sentence is formally parallel to my (64b), and the explanation that I provide holds for both sentences.

(i) a. John is still holed up in the cave.
b. #John isn't still holed up in the cave.

(ii) You can't convince me that someone isn't still holed up in this cave. [Baker 1970, ex. 20]
Paraphrasable as: I'm sure that someone is still holed up in the cave.
Not paraphrasable as: I'm sure that everyone is still holed up in the cave.

McCawley (1998), p. 594, notes, about (iii), that *some* must be interpreted in the scope of the lower negation and concludes that negation 'acts as if it is not within the subordinate S except for appearing on the tensed auxiliary verb of that S'.

(iii) You can't convince me that someone hasn't already solved this problem.

that everyone is hiding somewhere'), is precluded (it is exactly as degraded as the baseline (63a)).

We are thus in a position to discard the 'local and separate acceptability' hypothesis H2b. The 'cyclic' hypothesis H2e is corroborated: the system that checks the licensing of the two PPIs is subject to irreconcilable demands: the only constituents where *somewhere* is licensed (i.e. superconstituents of matrix PolP) are constituents in which *someone* is anti-licensed, and *vice versa*.

(65) (64b): *[$_{TP}$ [$_{\boxed{\text{PolP}\ \nearrow 1\ \searrow 2}}$ **impossible** [$_{CP}$ [$_{\boxed{\text{TP}\ \searrow 1\ \nearrow 2}}$ someone$_2$ T [$_{\boxed{\text{PolP}\ \searrow 1}}$ **not** somewhere$_1$ t$_2$ hide]]]]]

(66b) however is perfectly felicitous: it contains two occurrences of *some*, both under the embedded negation (the subject *some* is reconstructed under negation). Reconstruction is the only viable option for subject *some* when there is a clausemate *some* under negation. Superconstituents of the matrix PolP are constituents in which both PPIs are licensed (on any smaller constituent they are anti-licensed):

(66) a. —A: Someone is hiding.

b. —B: That's exactly true, it's impossible that someone isn't hiding somewhere.

(67) (66b): [$_{TP}$ T [$_{\boxed{\text{PolP}\ \nearrow 1\ \nearrow 2}}$ **impossible** [$_{CP}$ [$_{\boxed{\text{TP}\ \searrow 1\ \searrow 2}}$ t$_2$ T [$_{\boxed{\text{PolP}\ \searrow 1\ \searrow 2}}$ **not** someone$_2$ somewhere$_1$ t$_2$ hide]]]]]

Summarizing, of these two configurations, only the second one is well-formed, in accordance with the prediction made by the cyclic hypothesis H2e:

(68) a. *[$_S$ ... **not** ... [$_{S'}$ ... some$_2$ ... [**not** ... some$_1$ ...]]]

b. $[_{S} \ldots \textbf{not} \ldots [_{S'}\ t_2 \ldots [\ \textbf{not} \ldots \text{some}_2 \ldots \text{some}_1 \ldots]]]$

2.3.2.2 Adding a Level of Embedding

So far, we have considered cases where one of the occurrences of *some* is in need of rescuing. What happens if this is not the case, e.g. if we add a layer of embedding as schematized below?

(69) $[_{S} \ldots \textbf{not} \ldots [_{S'} \ldots \text{some}_2 \ldots [\ \textbf{not} \ldots [_{S''} \ldots \text{some}_1 \ldots]]]]$

For concreteness consider the acceptable (70a):

(70) a. Someone isn't trying to hide somewhere.

b. (70a): $[_{\boxed{\text{TP}\ \blacktriangle 1\ \blacktriangledown 2}}$ someone_2 T $[_{\boxed{\text{PolP}\ \blacktriangle 1}}$ **not** try $[_{\text{CP}}$ $[_{\text{TP}}$ T $[_{\boxed{\text{PolP}\ \blacktriangledown 1}}$ somewhere_1 hide]]]]]

Somewhere is not in the scope of a clausemate negation since the control predicate *try* creates a biclausal structure. The licensing of *somewhere* is secured on at least one constituent, namely the most deeply embedded PolP. There is no constituent where *someone* and *somewhere* are licensed simultaneously, but the lower PPI is licensed on some constituent contained in the constituent where the higher one is licensed. This is a configuration which the cyclic hypothesis H2e predicts to be well-formed ($some_1$ is licensed *within* the constituent in which $some_2$ is licensed). By the same token, if we embed the sentence under a negation, we obtain a sentence which is coherent with A's statement in the following discourse (B's replies forms a minimal pair with (64b)):

(71) a. —A: Everyone is trying to hide.

b. —B: That's exactly true, it's impossible that someone isn't trying to hide

somewhere.

(72) (71b): [$_{\text{TP3}}$ T [PolP3 ↗1 ↘2] **impossible** [$_{\text{CP}}$ [TP2 ↘1 ↗2] someone$_2$ T [PolP2 ↘1] **not** try [$_{\text{TP1}}$ PRO$_2$ T [PolP1 ↗1] somewhere$_1$ hide]]]]]]]

We are thus led to hypothesize that the system can proceed cyclically: the lower PPI in (71b) is licensed in PolP1 first, then the higher *some* is licensed in TP2 (all PIs contained in TP2 are licensed *within* it).

In (65) on p. 51 on the other hand, there is no room for such a cyclic procedure: on all eligible constituents where *somewhere* is the only PPI present, it finds itself in a DE environment (and is therefore anti-licensed and cannot be licensed on another cycle). And it cannot be licensed anywhere else, because every domain where it is acceptable is a domain where *someone* isn't.[23]

Summary

We have created ungrammatical configurations with two PPIs which all other known accounts predict to be separately acceptable (one is in the scope of a clausemate negation but is rescued, the other is not in the scope of a clausemate negation). I propose that the following condition be adopted:

(73) **Licensing Condition of Polarity Items (*final*):** A PI π is licensed in sentence S only if it is contained in at least one eligible constituent A of S which has the monotonicity properties required by π w.r.t. the position

[23]The minimally different (ib) is grammatical and felicitous: this is explained in section 2.3.3.3 p. 60.

(i) a. —A: Everyone is hiding.
b. —B: That's exactly true, it's impossible that anyone isn't hiding somewhere.

of π and all other PIs in A are licensed within A.

The data confirm that the acceptability of PPIs is computed on constituents in a cyclic fashion. There is no reason to think that the licensing of NPIs works any differently; but we cannot extend to NPIs the method that we used (having two PIs separated by two anti-licensers), simply because it is a matter of logic that two UE expressions do not compose into a DE expression (there is no flip-flop with UE expressions).

2.3.3 Co-occurrence of NPIs and PPIs

In this section, I present a new argument in favor of the environment-related approach to the acceptability conditions of both NPIs and PPIs. Remember that the evidence for domains of NPIs in English is mixed. There clearly exists a dialect of English in which (38b) repeated as (74) below is acceptable:

(74) I don't doubt that John did anything to help the Mafia.

Such facts have prompted general caution, if not skepticism, towards environment-based approaches in the past. My own conclusion in section 2.2.2.2 p. 35 was that a localist environment-related approach was not necessarily threatened by this example: one could indeed hypothesize that *any,* like French *quoi que ce soit,* has a smallest eligible domain, but this domain is smaller than the one of its French counterpart, and might even be minimally small (i.e. it is the smallest constituent which contains the NPI; the NPI is never licensed on this domain for want of a DE expression creating the appropriate context, but the system is allowed to check it nonetheless).

2.3.3.1 A PPI above an NPI, with One Negation

There is one prediction that follows from the 'cyclic' hypothesis H2e—the version of the environment-related approach which has so far passed muster. If there exists some procedure for checking the acceptability of polarity items on the basis of constituents, one expects to find constituents in which the opposite requirements of positive and negative polarity items create a tension that the system is unable to solve in any satisfying way. Let me map out in an abstract and simplified way the kind of situations that I have in mind. Assume that PPI π^+ is anti-licensed in a DE environment and NPI π^- is licensed in a DE environment. Suppose that the checking procedure applies to constituent XP and that there is no other constituent in the structure where licensing can be checked. Suppose further that XP is UE w.r.t. the positions of both π^+ and π^-.

(75) *[XP ↗1 ↗2 $\ldots \pi_1^+ \ldots \pi_2^- \ldots$]

On this constituent, the NPI π^- is anti-licensed: this, by virtue of the general licensing condition (73) p. 54, suffices to rule out the outcome, although the PPI $\pi+$ is acceptable (by hypothesis π^- cannot be licensed on another cycle). A symmetric situation arises if XP is DE w.r.t. the positions of both polarity items: this time the requirement of the PPI is left unsatisfied, leading to unacceptability, while the NPI is acceptable. Notice that in this situation the NPI can have an arbitrarily small minimal domain: it needs to find at least one constituent in which its position is DE. Finding such a constituent won't suffice if this constituent happens to also contain a PPI (per the licensing condition (73)).

(76) *[XP ↘1 ↘2 $\ldots \pi_1^+ \ldots \pi_2^- \ldots$]

If English *any,* as I claim, is licensed on a domain, we should be able to witness the clashes that the theory predicts. We actually do. Observe what happens in a sentence e.g. (77b) which contains only one DE expression (namely negation) outscoping the PPI *some* and the NPI *any* in that order (in paradigm (77) the a., c., and d. sentences are controls). The output is unacceptable, as predicted: the constituents on which *anything* is possibly acceptable contain an unacceptable *someone;* conversely, the constituents on which *someone* is potentially acceptable contain an unacceptable *anything.* Neither PI can be licensed on a separate cycle (this is an instantiation of the abstract (76)).

(77) a. It is impossible that John stole anything.

b. *It is impossible that someone stole anything.

c. It is impossible that someone stole something.

d. It is impossible that anyone stole anything.

(78) (77b): *[$_{TP}$ T [$_{\boxed{\text{PolP2}\ \searrow 1\ \searrow 2}}$ **impossible** [$_{CP}$ that [$_{\boxed{\text{TP}\ \nearrow 1\ \nearrow 2}}$ someone$_2$ T [$_{\boxed{\text{PolP1}\ \nearrow 1}}$ anything$_1$ t$_2$ steal t$_1$]]]]]

Adding a level of embedding doesn't salvage the sentence, because the sources of the unacceptability of (77b) carry over to (79b) (in paradigm (79) the a., c., and d. sentences are controls):

(79) a. It is impossible that Fred thinks that John stole anything.

b. *It is impossible that someone thinks that John stole anything.

c. It is impossible that someone thinks that John stole something.

d. It is impossible that anyone thinks that John stole anything.

(80) (79b): [$_{TP}$ T [$_{\boxed{\text{PolP2}\ \searrow 1\ \searrow 2}}$ **impossible** [$_{CP}$ that [$_{\boxed{\text{TP}\ \nearrow 1\ \nearrow 2}}$ someone$_2$ T t$_2$ think [$_{CP}$ [$_{TP}$ John T [$_{\boxed{\text{PolP1}\ \nearrow 1}}$ anything$_1$ steal t$_1$]]]]]]]

In brief, dependency leads to ungrammaticality when all the eligible domains of NPI π_k^- which are DE w.r.t. π_k^- contain PPI π_l^+ and all the eligible domains of PPI π_l^+ which are UE w.r.t. π_l^+ contain NPI π_k^-.[24]

2.3.3.2 A PPI above an NPI, with Two Negations

We are now going to add a negation; this will provide other cases where dependency restricts the possible readings that obtain with an NPI and a PPI. Preliminary to this, observe that the PPI *someone* can reconstruct under negation only if in this reconstructed position the PPI is in a UE environment, which happens e.g. if there is a DE expression in the superordinate clause (compare (81b) and (82b)).

(81) a. —A: No one is eating.

b. —B: #That's exactly true, someone isn't eating. *NEG>SOME

(82) a. —A: Someone is eating.

b. —B: That's exactly true, it's impossible that someone isn't eating.

NEG>NEG>SOME

The string *'it's impossible that someone isn't eating'* is ambiguous: the PPI need not be interpreted in its reconstructed position; when it isn't, the constituent on which the PPI is licensed is e.g. the embedded TP.

(83) a. —A: Everyone is eating.

[24]Merchant (2000) notes that an NPI in the restrictor of *some* cannot be licensed by a negation above *some.* He ascribes this anti-licensing to a conflict between the need of *some* to be interpreted (together with its restriction) above negation and the antagonistic need of *any* to be interpreted below. The facts are easily derived in my theory, because *some* is anti-licensed in its smallest possible domain.

(i) *Robin didn't read some books that any students read. [Merchant 2000, p. 148]

b. —B: That's exactly true, it's impossible that someone isn't eating.

NEG>SOME>NEG

In light of this consider (84), which we are going to embed under a negated attitude:

(84) Someone isn't eating anything.

(85) (84): [$_{\text{TP}\ \searrow 1\ \nearrow 2}$ someone$_2$ T [$_{\text{PolP}\ \searrow 1}$ **not** anything$_1$ t$_2$ eat t$_1$]]

The string *'it's impossible that someone isn't eating anything'* is not ambiguous (unlike the equivalent sentence without object *anything*). The reconstruction of the subject *someone* is impossible, for licensing reasons: when the NPI and the PPI co-occur in PolP (as is the case when the subject PPI reconstructs), their conflicting demands lead to a polarity clash (being in PolP, the PPI is in its smallest possible domain and thus cannot be licensed on a separate cycle).[25]

(86) a. (i) —A: Someone is eating.

(ii) —B: #That's exactly true, it's impossible that someone isn't eating anything.

(iii) —A: Everyone is eating.

(iv) —B: That's exactly true, it's impossible that someone isn't eating anything.[26]

(87) a. (86aii): *[$_{\text{TP}}$ T [$_{\text{PolP}\ \nearrow 1\ \nearrow 2}$ **impossible** [$_{\text{CP}}$ [$_{\text{TP}}$ t$_2$ T [$_{\text{PolP}\ \searrow 1\ \searrow 2}$ **not** someone$_2$ anything$_1$ t$_2$ eat t$_1$]]]]]

b. (86aiv): [$_{\text{TP}}$ T [$_{\text{PolP}\ \nearrow 1\ \searrow 2}$ **impossible** [$_{\text{CP}}$ [$_{\text{TP}\ \searrow 1\ \nearrow 2}$ someone$_2$ T

[25]Notice that a PPI and an NPI can co-occur in the same clause, therefore the clash that I'm describing cannot be due to some general incompatibility between NPIs and PPIs within the same clause.

[$_{\boxed{\text{PolP}}\ \boxed{\blacktriangle 1}}$ **not** anything$_1$ t$_2$ eat t$_1$]]]]]

These data are enlightening because they confirm the existence of domains of *some* as well as *any* (even for dialect A, in which flip-flop could not be evidenced directly).[27]

2.3.3.3 An NPI above a PPI

Some important refinement is in order: we need to consider what happens when the NPI and the PPI are flipped.

(88) $[_{\text{XP}} \ldots \pi^{-} \ldots \pi^{+}]$

(89b), where the PIs are clausemates, is far better (it is perfect for some speakers, for others it is marked but acceptable) than (77b). (90b) is universally accepted without

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[26]The opposite situation obtains when the PI under negation is a PPI instead of an NPI (cf. (64b) and (66b)).

[27]After Baker (1970), Ladusaw (1979) considered cases of so-called 'double negatives', i.e. rescued PPIs.

(i) a. You can't convince me that someone hasn't already finished the exam.
*NEG>SOME>NEG; NEG>NEG>SOME

b. You can't convince me that someone hasn't finished his exam yet.
NEG>SOME>NEG; *NEG>NEG>SOME
[Ladusaw 1979, ex. 24, p. 181]

He noticed that the only available interpretation of (ia) is one in which, in modern terms, the subject is reconstructed under negation. He also noticed that replacing the PPI with an NPI, as in (ib), has the opposite effect: this time the subject cannot reconstruct under negation. To account for these facts, Ladusaw resorts to a special form of negation, $\underline{\text{not}}_2$ found only in double negatives:

> '$\underline{\text{Not}}_2$ carries a conventional implicature that someone has believed until recently that the proposition in its scope was true' (e.g. in (ia) *'someone has already finished'*).

Positing a special form of negation (with maximal scope over the embedded clause) predicts that NPIs should not be allowed in 'double negatives' (but they are, as shown in this section), and doesn't explain the scope pattern of subject *some*. These facts however follow naturally from the hypothesis developed herein.

reservations (compare with (79b)).

(89) a. It is impossible that anyone stole a camera.

b. It is impossible that anyone stole something.

(90) a. It is impossible that anyone thinks that John stole a camera.

b. It is impossible that anyone thinks that John stole something.

The sentences are grammatical provided that the PPI is licensed on its local PolP, before the licensing of the NPI is checked. This option is what differentiates the grammatical (89b) and (90b) on the one hand from the ungrammatical (77b) and (79b).

(91) a. (89b): [$_{TP}$ T [$_{\text{PolP}\ \searrow 1\ \searrow 2}$ **impossible** [$_{CP}$ [$_{TP}$ anyone$_2$ T [$_{\text{PolP}\ \nearrow 1}$ something$_1$ t$_2$ steal t$_1$]]]]]

b. (90b): [$_{TP}$ T [$_{\text{PolP}\ \searrow 1\ \searrow 2}$ **impossible** [$_{CP}$ [$_{TP}$ anyone$_2$ T think [$_{CP}$ John T [$_{\text{PolP}\ \nearrow 1}$ something$_1$ t$_2$ steal t$_1$]]]]]]

We correctly predict that replacing *some* with *any* in (64b) on p. 50 produces a grammatical and felicitous sentence: there is at least one domain on which the NPI is acceptable, namely the matrix PolP and the same is true of the PPI (licensed in the same domain).

(92) a. —A: Everyone is hiding.

b. —B: That's exactly true, it's impossible that anyone isn't hiding somewhere.

(93) (92b): [$_{\text{PolP}\ \nearrow 1\ \searrow 2}$ **impossible** [$_{CP}$ [$_{\text{TP}\ \searrow 1\ \nearrow 2}$ anyone$_2$ T [$_{\text{PolP}\ \searrow 1}$ **not** somewhere$_1$ t$_2$ hide]]]]

Summary

This section has established that the acceptability of PIs is *dependent* on the acceptability of other PIs in the same domain. We have also provided evidence for the existence of a cyclic checking mechanism. In the next section, I provide further evidence in favor of domains and cyclicity, using scalar implicature triggers (and their (anti)-licensing effects on NPIs and PPIs) and the scope of deontic *must*.

2.4 Further Evidence for Domains

2.4.1 Monotonicity Disruption

2.4.1.1 NPIs and Monotonicity Disruption

Prior to this article, some have argued that the licensing of weak NPIs is sensitive to the meaning of constituents. This is the case of Chierchia (2004) in particular, who provides a semantic/pragmatic explanation of so-called intervention effects on weak NPIs. It has been known since Linebarger 1980, 1987 that the presence of certain quantifiers (e.g. *every, always*), of numerals, of *because*-clauses and of conjunction between an NPI and the closest DE expression above it causes the anti-licensing of the NPI.

(94) a. *When Fred speaks French, John doesn't always understand anything.
b. *When Fred speaks French, not everyone understands anything.
c. *When Fred speaks French, it's not the case that everyone understands anything.
d. *John didn't understand anything because it was easy but because he is smart.

e. *John didn't drink wine and any soda.

Compare with:

(95) a. I doubt that anyone understood anything.

b. John didn't drink wine or any soda.

Chierchia observes that the interveners form a natural class: they are strong scalar items. For example, *and* belongs to the scale <or, and>, and *every,* to the scale <some, every>. In light of this generalization, he proposes that these items trigger scalar implicatures (SIs), and that these inferences, when computed in conjunction with the literal meaning, are monotonicity-breakers, hence the observed anti-licensing of NPIs. What is important about this analysis is that it explicitly uses the meaning of constituents (a strengthened meaning which corresponds to the truth-conditional meaning augmented with scalar implicatures) for the computation of the licensing of weak NPIs, in line with this article's proposal.

Here is how the disruption effect arises, according to Chierchia's analysis. First of all, scalar implicatures are computed on constituents, recursively and in a bottom up fashion. For any expression E, $[\![E]\!]^{ALT}$ is the set of alternatives to E. If E doesn't contain any scalar terms, then $[\![E]\!]^{ALT}=[\![E]\!]$; in principle, E can contain more than one scalar term, but scalar implicatures, Chierchia claims, are computed locally as soon as their trigger appears; once a given scalar item enters the recursion, the alternatives it induces are computed; as the recursion proceeds, if another scalar term appears, the alternatives it induces do not compose with the alternatives of any previously introduced items.[28]

[28]Chierchia provides an example:

(i) a. some student smokes or drinks

b. LF: [some student$_i$ [t$_i$ smokes or t$_i$ drinks]]

Therefore for all E, $[\![E]\!]^{ALT}$ only yields the alternatives induced by the topmost scalar item in it. Let A be a set of alternatives and β a member of that set: Chierchia writes as $S_\beta(A)$ the weakest member of the set A which asymmetrically entails β.

Second, alongside the plain meaning of a given constituent γ, written as $[\![\gamma]\!]$, grammar provides a strengthened meaning, written as $[\![\gamma]\!]^s$, which is the conjunction of truth-conditional meaning and of scalar implicatures:

(96) $[\![\gamma]\!]^s = [\![\gamma]\!] \wedge \neg S_{[\![\gamma]\!]}[\![\gamma]\!]^{ALT}$

If it is the strengthened meaning that is relevant to the computation of NPI licensing, we straightforwardly derive the disruption effects. In effect, strong scalar items in downward-entailing contexts trigger *indirect* scalar implicatures (elsewhere, they don't trigger scalar implicatures).[29]

(97) Not everyone understands.

a. $[\![(97)]\!] = \neg\forall x\ [\text{person'}(x) \rightarrow \text{understand'}(x)]$

b. Scale: <some, every>

c. $[\![(97)]\!]^{ALT} = \{[\neg\forall x\ [\text{person'}(x) \rightarrow \text{understand'}(x)]], [\neg\exists x\ [\text{person'}(x) \wedge \text{understand'}(x)]]\ \}$

d. Implicature: $\neg S_{[\![(97)]\!]}[\![(97)]\!]^{ALT} = \neg\neg\exists x\ [\text{person'}(x) \wedge \text{understand'}(x)]$

c. $[\![[\ t_i \text{ smokes or } t_i \text{ drinks}]]\!]^{ALT} = \{\ [\text{smoke'}(x_i) \vee \text{drink'}(x_i)], [\text{smoke'}(x_i) \wedge \text{drink'}(x_i)]\}$

d. $[\![[\ \text{some student}_i\ [\ t_i \text{ smokes or } t_i \text{ drinks}]]]\!]^{ALT} = \{\text{some'(student')(smoke'} \vee \text{drink'}), \text{many'(student')(smoke'} \vee \text{drink'}), \text{every'(student')(smoke'} \vee \text{drink'})\}$

[29]Chierchia derives the distribution of NPIs from a semantic property and from a pragmatic principle which rules the use of the items that have this semantic property: he builds on Kadmon and Landman's (1993) idea that the domain of quantification of *any* is a widened one and argues that *any* is acceptable on a given constituent γ only if the strengthened meaning of γ is logically stronger than the strengthened meaning of the constituent in which the plain indefinite *some* replaces *any.* This happens in exactly those cases in which *any* is in a DE context. For the sake of simplicity, my presentation doesn't contain a comparison of the strengthened meanings of the alternatives with *any* and the ones with *some*.

(‘Someone understands.’)

e. $[\![(97)]\!]^s = \neg\forall x\ [person'(x) \rightarrow understand'(x)] \wedge \exists x\ [person'(x) \wedge understand'(x)]$

(‘Not everyone but someone understands.’)

The position of α in (98a) is DE if the plain meaning is taken into account:

(98) Not everyone understands α.

a. [[Not everyone] α_1 understands t_1]

b. $[\![$ simple thing $]\!] \Rightarrow [\![$ thing $]\!]$

c. Not everyone understands a thing.

d. Not everyone understands a simple thing.

e. Not everyone understands a thing $\Rightarrow$ Not everyone understands a simple thing.

But it is non-monotonic, hence not DE, when the strengthened meaning is taken into account:

(99) a. $[\![(98c)]\!]^s = \neg\forall x\ [person'(x) \rightarrow understand'(x, thing')] \wedge \exists y\ [person'(y) \wedge understand'(y, thing')]$

b. $[\![(98d)]\!]^s = \neg\forall x\ [person'(x) \rightarrow understand'(x, simple\_thing')] \wedge \exists y\ [person'(y) \wedge understand'(y, simple\_thing')]$

c. $[\![(98c)]\!]^s \not\Rightarrow [\![(98d)]\!]^s$

d. $[\![(98d)]\!]^s \not\Rightarrow [\![(98c)]\!]^s$

The following LF shows that *any* has no DE domain if, as Chierchia claims, indirect scalar implicatures are obligatorily factored into the computation (a remark about nota-

tion: the label $\boxed{\text{YP}}\boxed{\asymp x}$ indicates that YP is non-monotonic w.r.t. the position in which the bearer of index *x* is interpreted):[30]

(100) (94b): *[$_{\boxed{\text{TP}}\boxed{\asymp 1}}$ T [$_{\boxed{\text{PolP}}\boxed{\asymp 1}}$ **not** everyone anything$_1$ understand t$_1$]]

2.4.1.2 PPIs and Monotonicity Disruption

Just like *any*, PPI *some* is sensitive to the effect of so-called interveners. *Some* is licit under a clausemate negation if a certain kind of elements intervene (when this happens, *some* is 'shielded'): these happen to be the very elements which create so-called intervention effects on NPIs, i.e. (certain) quantifiers, numerals, *because*-clauses, and conjunction. I claim that this is not an accident.

(101) a. When Fred speaks French, Jean-Paul doesn't always understand something. ✓n.s. of SOME

b. When Fred speaks French, not everyone understands something.[31] ✓n.s. of SOME

c. John didn't understand something because it was easy but because he is smart. ✓n.s. of SOME

d. John didn't drink wine and some soda. ✓n.s. of SOME

[30] I assume that *not every* doesn't form a constituent: it is the spell-out of sentential negation and of *every* in its scope (which means that the quantifier is contained in PolP). The fact that *not every* cannot appear in object position lends some support to this assumption. Besides, split-scope, which is used as evidence in favor of a similar analysis for *no one*, is also possible with *not every* (although *must* and *supposed to* do not allow split-scope, for a reason that I do not understand).

(i) *Context:* Words of wisdom found on a management consultant's blog.
Although each member is entitled to be on the board, not everybody can be on the board.
NEG > CAN > EVERY

Insofar as the disruption effects created by strong scalar terms on NPIs bear witness to the role of environments (cf. 2.4.1.1), the PPI facts (which are in this respect the perfect mirror image of the NPI facts, compare (94) repeated as (102) below and (101)) suggest that the anti-licensing of PPIs is environment-based and that the monotonicity of the environment is what matters to licensing.

(102) a. *When Fred speaks French, John doesn't always understand anything.
b. *When Fred speaks French, not everyone understands anything.
c. *John didn't understand anything because it was easy but because he is smart.
d. *John didn't drink wine and any soda.

To interpret these data, we need to proceed stepwise, though. Even if we grant that the monotonicity of the environment of *some* in (101) is affected in a way that makes it acceptable, there are still two options to consider, at least as far as (101a) and (101b) are concerned. The presence of a universal quantifier (be it over individuals or over instants) under a negation creates a DE environment, as can be checked intuitively:

(103) a. $[\![$ red car $]\!] \Rightarrow [\![$ car $]\!]$
b. Not everyone has a car $\Rightarrow$ Not everyone has a red car. *(DE)*

In the examples we have considered so far, the expressions that anti-license *some*, i.e. negation and negative quantifiers, denote Downward-entailing functions which also

[31] If we replace *everyone* with the existential (and NPI) *a single person*, narrow scope of *some* is impossible. This is because *not* is sitting in Spec,PolP, just as it is presumably in (101b), and an existential cannot modify the monotonicity of the context in this configuration.

(i) When Fred speaks French, not a single person understands something. *n.s. of SOME

have the property of being Anti-additive (Zwarts 1998):

(104) **Anti-additivity:** A function f is Anti-additive (AA) iff $f(A \vee B) \iff f(A) \wedge f(B)$

The equivalence is intuitively verified by negation and by negative quantifiers e.g. *no one:*

(105) a. John doesn't smoke or drink $\iff$ John doesn't smoke and John doesn't drink

b. No one smokes or drinks $\iff$ No one smokes and no one drinks

All AA functions are also DE functions; but the reverse is not true. The presence of a universal quantifier under negation creates a DE, non Anti-additive environment:

(106) a. Not everyone has a car $\Rightarrow$ not everyone has a red car. *(DE)*

b. Not everyone smokes and not everyone drinks $\not\Rightarrow$ not everyone smokes or drinks. *(not AA)*

So it is conceivable that *some* is only illicit in AA environments. But it is equally conceivable that *some* is illicit in all DE environments (AA environments are DE): the Chierchia 'interveners' ruin the monotonicity of the environment of *some*, and its acceptability conditions are therefore met in the presence of an intervener (provided the strengthened meaning is taken into account).

(107) a. [[Not everyone] α_1 understands t_1]

b. $[\![(107a)]\!]^s = \neg\forall x\ [\text{person}'(x) \rightarrow \text{understand}'(x,\alpha')] \wedge$
$\exists y\ [\text{person}'(y) \wedge \text{understand}'(y,\alpha')]$

(107a), when evaluated with the function $[\![\cdot]\!]^s$, is non-monotonic w.r.t. the position of α (cf. (99)).

At this point in the discussion, adjudicating between the two options (intolerance to AA environments vs. intolerance to merely DE environments) is impossible. But in the next section 2.4.1.3, I provide evidence in favor of the hypothesis that *some* is illicit in DE environments, therefore in favor of the hypothesis that in (101) indirect scalar implicatures are factored in that ruin the monotonicity of the environment.

2.4.1.3 Downward-entailingness or Anti-additivity?

With the new polarity clash test 2.3.3 in hand, we can turn to the question of the logical property that anti-licenses *some.* I have been assuming that DEness anti-licenses *some.* But this view is usually rejected, since strictly DE expressions such as *at most five people* do not seem to be disruptive, whereas AA expressions such as *no one* clearly are:

(108) a. When Fred speaks French, at most five people understand something.
b. *When Fred speaks French, no one understands something.

One difference that this kind of descriptions omit is that the syntactic position of subject DE quantifiers is not the same as the position of negation, and consequently of negative quantifiers: if we assume that the former are interpreted in Spec,TP, we are led to the conclusion that negative quantifiers are interpreted lower than T. In fact, negative quantifiers are the spell-out of negation and of an existential quantifier: therefore a subject negative quantifier inevitably creates a DE environment in the local PolP of an object PPI, while a subject DE quantifier doesn't. The pair shown in (108) is thus inconclusive: it is impossible to tell whether (108a) is grammatical because strict DE-

ness is innocuous, or because the subject quantifier, although it is a potential offender, is far enough to leave the PPI unaffected in its smallest domain. In order to ascertain whether strict DE expressions anti-license *some*, I propose that we set up a configuration with two PIs, a PPI (*some)* and an NPI (*any*), such that we enforce the following alternative: either checking occurs on a constituent where the NPI is not in a DE environment (and therefore yields an error), or the NPI and the PPI are both in a strictly DE environment. The latter is the only viable option: only it makes room for the licensing of the NPI. All that matters now is the fate of the PPI *some.* The prediction is the following: if *some* is impervious to DEness, the sentence is grammatical, whereas if *some* is vulnerable to DEness, the sentence is out. (109a) realizes the envisaged configuration, and the data lend support to the hypothesis that *some* is anti-licensed by DEness, contrary to the consensus: in (109a), the strictly DE expression *at most five people* outscopes both *someone* and *anything*, neither can be independently licensed (assuming that the NPI cannot raise out of PolP), and the result is clearly deviant.

(109) a. *At most five people sold someone anything.

b. (109a): *[$_{\text{TP}}$ ↖1 ↖2 **at most 5 people** T [$_{\text{PolP}}$ ↗1 ↗2 someone$_2$ anything$_1$ sell t$_2$ t$_1$]]

The important lesson that we can draw from this is that the PPI *some* is vulnerable to DEness, rather than Anti-additivity. Is *some* also vulnerable to non-monotonicity? We can now answer this question: although negation creates AA environments, the presence of a quantifier in its scope alters the logical properties of the environment below: from AA it becomes strictly DE (cf. (106) on p. 67).

Some is licit in those environments created by quantificational interveners (110), but we've just established that it is vulnerable to DE environments.

(110) Not everyone understands something. ✓n.s. of SOME

We are faced with a paradox. The solution lies in the obligatory indirect scalar implicature that a strong scalar term yields in a DE environment (following Chierchia 2004). Once the SI is factored into the meaning of the constituent, the environment of the PPI is non-monotonic. Consequently, *some* is not vulnerable to non-monotonicity. This conclusion is directly corroborated by (111), where *some* is in the scope of a non-monotonic quantifier in its smallest possible domain: PolP is non-monotonic w.r.t. its position because the composition of a DE function and of a non-monotonic function is non-monotonic;[32] the theories which make use of the notion of immediate scope (such as Szabolcsi 2004)[33] will also conclude from (111) that non-monotonic functions are not PPI anti-licensers since *some* can be interpreted in the immediate scope of a non-monotonic function.

[32]To see this in an intuitive way, consider the following sentences. In a situation in which exactly ten people brought a cake and exactly three people brought a chocolate cake, the entailment from (ia) to (ib) doesn't hold; in a situation in which exactly three people brought a cake and no one brought a chocolate cake, the reversed entailment doesn't hold:

(i) a. It's not the case that exactly three people brought a cake.
b. It's not the case that exactly three people brought a chocolate cake.
c. (ia) $\not\Rightarrow$ (ib)
d. (ib) $\not\Rightarrow$ (ia)

[33]Caveat: the notion of immediate scope is inherited from Linebarger 1980: it has survived in various guises to this day. It is no longer claimed that any scope-bearing element interferes with licensing when sandwiched between a licenser and an NPI. A number of such elements don't create an interference, i.e. *any*, bare plurals, non-numerical indefinites, embedding predicates, e.g. modal verbs. For example (I check that the narrow scope reading of *any*, which entails the wide scope reading, does exist by using a falsity test):

(i) —A: John doesn't have to read anything.
—B: False, it is required that he reads.

Immediate scope is therefore no longer an empirically adequate notion but some authors continue to use it nonetheless, whether or not they have an explanation to offer for the disruption facts that it was designed to account for.

(111) No salesclerk sold exactly 2153 people *anything/something.[34]

✓n.s. of SOME

Some is not vulnerable to non-monotonicity and it is not vulnerable to upward-entailingness either, therefore only downward-entailingness anti-licenses it. *Any* has symmetric properties: it is vulnerable to upward-entailingness and to non-monotonicity (I exploit this fact further in section 2.6).

Summary

Scalar implicatures can ruin the monotonicity of a constituent: they lead to the anti-licensing of NPIs; symmetrically, they salvage PPIs in the scope of a clausemate anti-licenser. There is no need to treat the NPI and the PPI phenomena differently: shielding and intervention are one and the same thing, seen from two different angles. Dependency allows us to demonstrate that *some* is vulnerable to the very environments that *any* is in need of. When they occur in the same surface position, they do so trough different derivational histories. In some circumstances, a PI bears on its sleeves the derivational history that led to its occurrence: this is the case with deontic *must*, whose semantic scope w.r.t. negation is a reliable indicator of its syntactic position.

[34]For some speakers, non-monotonic quantifiers can license weak NPIs in their nuclear scope (Rothschild 2006). But high numbers in the restrictor do not allow this licensing. The potential confounding factor is controlled for in (111):

(i) a. Exactly three students read anything.
b. *Exactly 2153 students read anything.

2.4.2 Scope of Deontic *must*

The deontic modal *must* is a PPI: this fact is carefully established in Homer 2010b and Homer 2010c, Chapter 4 of this dissertation (as claimed first in Israel 1996, and recently in Iatridou and Zeijlstra 2009). The property of *must* that bears directly on the present discussion is its ability to QR past an offending negation (I propose to call this movement 'escaping', cf. Homer 2010b). It is base-generated under negation, as the head of a VP, but like all PPIs, it cannot remain in the scope of a clausemate negation in an eligible constituent unless it is rescued or shielded (it can also be interpreted under a superordinate negation). Therefore the LF of (112a), which is precisely a case where *must* is neither rescued nor shielded, is as in (112b).

(112) a. John mustn't leave. MUST>NEG;*NEG>MUST

b. [John$_1$ must$_2$ not t$_2$ [t$_1$ leave]]

Remarkably, when *must* is shielded, it cannot raise.[35]

(113) Not everyone must leave. *MUST>NEG; NEG>MUST

We can thus lay down the following principle:

(114) **Principle of Laziness:** For any constituent A, don't move a PPI π^+ for acceptability purposes if A is not DE w.r.t. the position of π^+.

Note that the mere presence of an intermediate quantifier (for example the existential *a single person*) doesn't block the movement of the PPI:

[35]When it is not shielded, it can raise: there is no indication that it has to raise. Failure to raise leads to ungrammaticality in a number of cases, but there is no evidence that some principle forces the modal to raise whenever this is possible, cf. the discussion in 2.5.

(115) Not a single person must leave. MUST>NEG; *NEG>MUST

The hypothesis defended here explains the fact: the smallest possible domain of *must* in (113) doesn't have the same logical properties as the one in (112a). In the former, *must* is in an AA environment, whereas in the latter it is either in a DE environment (if the indirect scalar implicature triggered by the universal quantifier *'someone must leave'* is not factored in) or in a non-monotonic environment (if the indirect SI is factored in). We have no direct way to decide whether or not the implicature is factored in in the case at hand: it is conceivable that *must* is only anti-licensed in AA environments, therefore the incorporation of the SI into the meaning that is relevant to the computation of the acceptability conditions is unnecessary and doesn't take place; it is equally conceivable that the SI is obligatorily incorporated. The latter hypothesis has more to recommend itself than the former: weak NPIs are anti-licensed by Chierchia 'interveners', i.e. by obligatory indirect SIs. If speakers could abstain from incorporating the SI at their leisure along some kind of charity principle, weak NPIs could be saved, contrary to fact. Whether the SI is incorporated or not, we lack evidence to decide whether *must* is vulnerable to mere DEness or to Anti-additivity (because the polarity clash test doesn't apply, see section 2.9.2).

To sum up, the semantic scope of deontic *must* w.r.t. negation unambiguously indicates its syntactic position w.r.t. negation, because (i.) it has the ability to move past an offending clausemate negation, and (ii.) it only moves when it has to; its scope is therefore an indication of the polarity of its local context (the scope of *some* on the other hand is known to be particularly flexible, since it can always outscope negation, perhaps because its semantic scope is the reflexion of a choice function construal rather than of QR, see Reinhart 1997).

The interesting fact is observed when *must* is in the scope of two DE expressions, the lower one being a clausemate negation: two readings obtain. The reason is that two options arise: *must* takes narrowest scope under the two DE expressions (there is flip-flop, i.e. it is 'rescued' in the Szabolcsi sense of the word, as in (116a)) or it takes intermediate scope between the two as in (116b).

(116) a. (Speaking about a five-year-old boy, whose parents are very demanding.)
–This poor kid does so many chores: he must$_{deon}$ empty the dishwasher, feed the dog, clean his bedroom, make his bed...
–Yes, you're right, and I'm not sure that he must$_{deon}$n't rake the leaves too. NEG > NEG > MUST$_{deon}$

b. I know that John's condition imposes drastic precautions, but even then I'm not sure that he mustn't rake the leaves.[36]
NEG > MUST$_{deon}$ >NEG

The existence of these two readings is intriguing in the light of the Principle of Laziness (114) (the prohibition on raising when *must* is rescued). If this principle is indeed at

[36]The contracted form *mustn't* is on its way out in certain dialects of English, for example American English. But it is important to use it in our test, because the contraction indicates that the negation is a clausemate of *must.* The evidence that contraction is not possible with subordinate negation comes from modals which can only take semantic scope over negation in non-contracted forms (just like deontic *must* and other root modals, abilitative *could* is generated under negation; unlike deontic *must,* it need not raise past it (hence it cannot) because it is not a PPI):

(i) a. John could$_{abil}$ not swim. COULD>NEG; NEG>COULD
b. John could$_{abil}$n't swim. *COULD>NEG; NEG>COULD

Root modals are main verbs, which embed an infinitive. Non contracted forms of negation with *must* are either clausemate or subordinate negations (with no semantic difference between the two options):

(ii) John must not swim.

play in grammar, then the intermediate scope of *must* should be impossible: being rescued, *must* need not raise past the clausemate negation, and therefore should not be allowed to do so. But it can in fact optionally raise, as shown by (116b). The facts become intelligible once seen from the cyclic perspective that we are advocating here. Consider the following simplified LF (the label $\boxed{\text{YP}}\boxed{\text{AA x}}$ indicates that YP is AA w.r.t. the position where the bearer of index x is interpreted):

(117) $[_{\boxed{\text{PolP2}}\boxed{\nearrow 1}}$ **not** sure $[_{\text{CP}}$ $[_{\boxed{\text{XP}}\boxed{\text{AA 1}}}$ $[_{\boxed{\text{PolP1}}\boxed{\text{AA 1}}}$ **not** must$_1$ [he rake . . .]]]]]

To derive the above facts, we need only consider three cases.

1. When licensing is checked on PolP1, *must* is anti-licensed, and there is no room for it to move anywhere above the offending negation: the sentence doesn't converge if the checking procedure stops at this stage.

2. There is however at least one constituent in the embedded clause which (i.) is an eligible constituent for licensing purposes, (ii.) is larger than PolP1 and (iii.) offers a landing site for the modal to raise to (it is labeled XP in the above LF): in XP, *must* is still anti-licensed prior to movement (i.e. in the LF shown in (117)), but it is licensed after movement (i.e. in the LF shown in (118)). This is how the intermediate reading illustrated in (116b) obtains. The reason this reading is tied to the existence of an eligible constituent in the embedded clause is that QR is, by a large consensus, clause-bounded.

(118) $[_{\boxed{\text{PolP2}}\boxed{\nwarrow 1}}$ **not** sure $[_{\text{CP}}$ $[_{\boxed{\text{XP}}\boxed{\nearrow 1}}$ must$_1$ $[_{\text{PolP1}}$ **not** t$_1$ [he rake . . .]]]]]

3. Lastly, when anti-licensing is checked on PolP2 and movement hasn't taken place (117), the modal finds itself in a UE environment (it is rescued), therefore it doesn't have to QR and cannot do so, per (114): reading (116a) obtains.

To sum up, there are two converging situations, and they give rise to the two observed readings: the sentence converges either when licensing is checked on PolP2 of LF (117) (reading (116a)), or when licensing is checked on some embedded XP of LF (118) that contains PolP1 (the reading is illustrated in (116b)).[37]

Importantly, we observe that QR is partially determined by PI acceptability. We witness a movement which is only possible when a PI is not acceptable on a given constituent: escaping seems to be blocked when made unnecessary (=when the PPI is rescued), although it would have a semantic effect if it took place, and would hence be allowed according to standard assumptions about movement, in particular Fox's Scope Economy Principle (Fox 2000). I don't know of any other instance of such a condition on QR.

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[37]French deontic *devoir* and *falloir* are PPIs too. They differ from *must* in that they can but need not be interpreted above a clausemate negation:

(i) *Jean ne doit*$_{deon}$ *pas faire de jogging.*
Jean NEG must NEG do of jogging
'John must not jog/John is not required to jog.'

What shows that *devoir* is a PPI is that its wide scope over negation is blocked when it is shielded by a strong scalar term e.g. *souvent* 'often'. To control for the position of the adverb (i.e. make sure that it is in the matrix) I replace the complement of the modal with a pronoun (right-dislocation):

(ii) *Jean ne le doit*$_{deon}$ *pas souvent, faire du jogging.*
Jean NEG it must NEG often do of-the jogging
'Jean is not often required to jog.' (only reading)

I propose that *devoir*$_{deon}$ can take narrow scope under a clausemate negation—although it is a PPI—because its smallest possible domain is smaller than PolP. It is only when its licensing is checked on superconstituents of PolP that it has to raise (unless the Principle of Laziness makes this movement impossible, due to shielding).

2.5 Cyclicity

We have now gathered enough evidence about the licensing of PIs to draw some conclusions. First of all, the licensing procedure proceeds cyclically. I repeat some of the crucial pieces of evidence below:

(119) a. Mary didn't tell anyone that John didn't do anything to help the Mafia.

b. It's impossible that someone isn't hiding somewhere.

*w.s. of SOMEONE

c. It's impossible that someone isn't trying to hide somewhere.

✓w.s. of SOMEONE

d. *It's impossible that someone stole anything.

e. It's impossible that anyone stole something.

f. It's impossible that someone isn't eating anything. *n.s. of SOMEONE

This begs a fundamental question: what is licensing? Our licensing condition (73) says that a PI is licensed provided that it is acceptable on some domain (and the other PIs in that domain are concomitantly licensed within that domain). But why is one appropriate domain sufficient? The reader is probably accustomed to this kind of condition about NPIs and might fail to see how puzzling it really is. When applied to PPIs, the condition is perhaps more evidently intriguing. Why should a PPI be licensed provided that it is acceptable on some domain? The requirement relative to a PPI is negative: it must not be placed in a DE environment. But it is hard to see how the existence of one constituent which is not DE w.r.t. it can satisfy the requirement, given that there might be an arbitrarily large number of constituents which are DE w.r.t. its position in the same sentence. Global acceptability seems a priori more intuitive, but we know that it is not enforced.

The mystery lies in the existential quantification in the licensing condition. Operator-based approaches solve the puzzle by invoking feature checking (or a variant thereof). But environment-based approaches don't have a natural way of accounting for it. Or so it seems: I propose that the best way to understand the existential condition is to reverse the perspective. We usually call licensing of a PI what is in fact the *validation of a constituent.* It is the cyclic nature of licensing which tells us that. If a constituent contains no unacceptable PIs, it gets validated, and subsequent verifications of larger constituents cannot change that. This suggests that there is a course of operations that make up what is usually referred to as LF (assuming the standard Y model): polarity checking is one such operation; the operations occur in a rigid order; operation *n* can only take place if operation *n-1* has been completed first; if one link of the chain is missing, the whole derivation crashes.[38] Validating a constituent sends it off to the next operation: all the constituents have to be sent off to the next operation. Ungrammaticality occurs when not all the constituents of a sentence are sent off to the next level and this happens e.g. when all the eligible domains of NPI π_k^- which are DE w.r.t. π_k^- contain PPI π_l^+ and all the eligible domains of PPI π_l^+ which are UE w.r.t. π_l^+ contain NPI π_k^- (119d). Once a constituent is sent off (validated) it is no longer accessible: in the case at hand, this means that the PIs it contains cannot get anti-licensed or manipulated in any way.

The next question is: when does the validation of a constituent occur? It is obviously not the case that for each node that the checking procedure runs into, the constituent dominated by that node has to be validated, for two reasons. First, there exist smallest possible domains (e.g. PolP for *some*). Second, although every constituent must be sent off, the number of shipments is not important. Consider a sentence *S* with four levels of embedding; *S* contains the NPI π_k^- in the most deeply embedded clause;

[38]In Homer 2010d, Chapter 3 of this dissertation, I provide evidence for a multilayered LF from the interaction between NPIs and presuppositions.

only S is DE w.r.t. π_k^-: no constituent can be validated until the top node is reached. In this case, only one shipment takes place. But what the inspection of *must* reveals is that validation can be delayed even when a constituent is found which is acceptable w.r.t. all the PIs it contains: recall that *must* can take either narrow or intermediate scope when it is generated below two negations, one of which is a clausemate. The following pair illustrates this fact (cf. also (116) on p. 74):

(120) a. The coroner is the most competent person I know but this is a free country: he does nothing that must$_{deon}$n't be done over again.

NEG > MUST > NEG

b. The coroner does nothing that must$_{deon}$n't be done over again, he is so unbelievably incompetent! NEG > NEG > MUST

(121) a. (120a): [$_{TP}$ T [$_{\boxed{\text{PolP}}\boxed{\text{AA 1}}}$ **not** thing [$_{CP}$ that [$_{\boxed{\text{TP}}\boxed{\nearrow 1}}$ must$_1$ [$_{PolP}$ **not** t$_1$ ...]]]]

b. (120b): [$_{TP}$ T [$_{\boxed{\text{PolP}}\boxed{\nearrow 1}}$ **not** thing [$_{CP}$ that [$_{TP}$ [$_{\boxed{\text{PolP}}\boxed{\text{AA 1}}}$ **not** must$_1$ ...]]]]

(120a) and (120b) exhibit two distinct derivational histories. The licensing of *must* occurs on a larger constituent in the latter than in the former: the smallest constituent containing *must* that gets sent off (validated) in (120b) is the matrix PolP (it is a sub-constituent of the embedded clause in (120a)): on the matrix PolP, QR of *must* is either blocked (if *must* is in its base position when the matrix PolP is scanned) or undone (if QR has taken place to escape from negation when the embedded clause was scanned), because it moves *must* into a AA environment; as a result, the modal is interpreted with narrowest scope. This shows that is has not been licensed on the embedded clause: otherwise it would be inaccessible (constituents where the licensing of a PI takes place are by hypothesis sent off (validated)). In other words, validation can be delayed and

is not mandatory when possible. The ‘first’ occasion for validation occurs in the embedded clause, when the modal QRs past the offending negation: the embedded CP is UE w.r.t. its landing position, hence favorable. Validation can occur at this stage, as evidenced by (120a), or be delayed, presumably even if the modal has not raised to a secure position, as evidenced by (120b). To sum up, decisions relative to the point of validation are made during the checking procedure; movements can take place at LF that are motivated by the acceptability of PIs.

The latter fact might conjure up a different picture than the one I have just delineated: one can imagine that there is no LF component separate from core syntax, and that the interpretation processes are contemporaneous with the syntactic derivation by phase. Perhaps PolP and the other domains of PIs are nothing but the phases that syntactic theory postulates. The movements that are motivated by licensing purposes do not, under this view, occur after the sentence has been spelled out but during the derivation itself. Attractive though this alternative hypothesis may be, it raises an issue. When phases are spelled out at their edge, they cannot be frozen, i.e. the PIs they contain cannot become inaccessible for licensing. Otherwise, an NPI separated from a potential licenser by a phase boundary could not be licensed, contrary to fact. Not all theories of phases assume that they are impenetrable (Fox and Pesetsky 2005), therefore this idea is in principle viable. What is more troubling is that we seem to have lost the explanation for the existential quantification in the licensing condition: in the previous analysis, validation was a necessary condition for the continuation of a multilayered interpretation process; in this analysis, we are back to the mystery that I described earlier, i.e. it is not clear why the licensing procedure is cyclic rather than global.

2.6 A Hypothesis about *any* as a PPI in Disguise

One moral of the present investigation of polarity is that *some* and *any* are in complementary distribution, in the specific sense that cannot be licensed in the same environment: the former is only acceptable in non-DE environments, and the latter is only acceptable in DE environments. This is evident in minimally small structures, i.e. when the polarity items occur in PolP and there is only one DE expression in that constituent:

(122) a. John didn't understand something. *NEG>SOME

b. John didn't understand anything.

One is easily misled into thinking they are not in complementary distribution because of the way the licensing condition can be met. Suppose constituent A is scanned for licensing, and A contains a position that is to be filled by either *some* or *any*: only one of the two is licit in A, but the other can be spelled out if it is licensed on a subconstituent of A. This gives rise to the deceptive impression of optionality that emerges e.g. from the two pairs below: on my account, in each of the sentences, the licensing of the PPI doesn't occur in the same constituent as the licensing of the NPI.

(123) a. It is impossible that John understood something.

b. It is impossible that John understood anything.

(124) a. It is impossible that John didn't understand something.

b. It is impossible that John didn't understand anything.

Having established complementary distribution, we are led to revive the very first idea (Klima 1964) that *some* and *any* are only superficially different and are either identical

or very intimately related at some deeper level.

I want to pursue the idea that *any* is derived from a PPI (perhaps *some* itself), and I think French offers some interesting evidence in favor of this derivational link between PPIs and NPIs. In French, singular *quelque* is a PPI: just like *some* in English, it is illicit in the scope of a clausemate negation but can be rescued or shielded.

(125) a. **Jean n' a pas compris quelque chose.*[39]
Jean NEG has NEG understood some thing
'Jean didn't understand something.'

b. *Il est impossible que Jean ait compris quelque chose.*
it is impossible that Jean have.SUBJ understood some thing

c. *Il est impossible que Jean n' ait pas compris quelque chose.*
it is impossible that Jean NEG have.SUBJ NEG understood some thing

d. *Jean ne comprend pas toujours quelque chose.*
Jean NEG understands NEG always some thing

Quelque is grammatical under a clausemate negation when its restrictor is modified by a certain relative clause in the subjunctive:

(126) *Jean n' a pas compris quelque chose que ce soit.*
Jean NEG has NEG understood some thing that this be.SUBJ
'Jean didn't understand anything.'

The phrase that results from the addition of the modifier is only licit in a DE environment: it is a (weak) NPI.

[39]The asterisk indicates that the narrow scope of *quelque* is impossible.

(127) a. **Jean a compris quelque chose que ce soit.*
Jean has understood some thing that this be.SUBJ
Intended: *'Jean understood anything.'*

b. **Quelque chose que ce soit a eu lieu.*
some thing that this be.SUBJ has taken place
Intended: *'Anything took place.'*

c. ??*Exactement trois personnes ont compris quelque chose que ce soit.*
exactly three people have understood some thing that this be.SUBJ
Intended: *'Exactly tree people understood anything.'*

d. ??*Tout le monde n' a pas compris quelque chose que ce soit.*
all the people NEG have NEG understood some thing that this be.SUBJ
Intended: *'Not everybody understood anything.'*

e. *Moins de trois personnes ont compris quelque chose que ce soit.*
less of three people have understood some thing that this be.SUBJ
'Fewer than three people understood anything.'

Furthermore, there is a strong intuition that the effect of the subjunctive relative is a widening of the domain that *quelque* quantifies over. Summing up, French has a productive way of forming NPIs, which exhibit the widening property described as characteristic of weak NPIs in Kadmon and Landman's (1993) classic study and in much subsequent work.

But all we see really is a PPI being salvaged by the addition of an appropriate modifier. The addition is only licit when the acceptability of the PPI is checked on a constituent which is DE w.r.t. the PPI: when there is no DE-environment that the modified PPI is placed in, it is excluded. Recall that when we discussed *must* (section 2.4.2) we observed that it cannot raise across negation when it is shielded, i.e. when

it is in a non-monotonic environment. I then laid down a *Principle of Laziness* (114) to the effect that the movement of a PPI is disallowed when it is unnecessary. We can profitably generalize it as follows:

(128) **Principle of Laziness Generalized:** For any constituent A, don't modify PPI α (either by movement or by adjunction), if α is not anti-licensed in A.

The principle is too strong as it stands: PPIs are salvaged by postnominal modification ((150b), (151b), and (152b) and their French equivalents) but they can appear with some of the modifiers (but not the subjunctive relative *que ce soit*) outside of DE environments. It is therefore necessary to add some restriction to the principle: certain modifications are disallowed outside of DE environments. I leave to future research a characterization of the modifications that salvage PPIs. But what we can already glean from our data is that a subset of the salvaging modifications (the domain widening ones) share some property with QR: this property makes them improper out of DE environments. Suppose the two operations, QR and domain-widening modification, form a class: let's call them ρ operations. What could the property that unifies them be? An answer suggests itself (it is in keeping with previous research on NPIs (Kadmon and Landman 1993)): in DE environments (and only there) the ρ operations have the effect of yielding an outcome which is logically stronger than their input. Their execution might be ruled by the following principle (a generalization of Kadmon and Landman's 1993 principle[40]), which applies locally:

[40]Here is how they define strengthening:

(i) **STRENGTHENING:** *Any* is licensed only if the widening that it induces creates a stronger statement, i.e. only if the statement on the wide interpretation $\Rightarrow$ the statement on the narrow interpretation. Kadmon and Landman 1993, p. 369]

(129) **Strengthening Principle:** Apply a ρ operation only if it leads to strengthening.

First consider the PPI *must*, analyzed as a universal quantifier over possible worlds: the meaning of XP after QR of the modal past negation is logically stronger than its meaning prior to movement.

(130) a. $[_{XP}$ **not** must $[_{YP}$]]

b. $[_{XP}$ must$_1$ **not** t$_1$ $[_{YP}$]]

c. $[\![$ (130b) $]\!]^s \Rightarrow [\![$ (130a) $]\!]^s$

Cases where QR of *must* is blocked are cases where the output is not stronger than the input:[41]

(131) a. $[_{XP}$ **not** every must $[_{YP}$]]

b. $[_{XP}$ must$_1$ **not** every t$_1$ $[_{YP}$]]

c. $[\![$ (131b) $]\!]^s \not\Rightarrow [\![$ (131a) $]\!]^s$

d. $[\![$ (131a) $]\!]^s \not\Rightarrow [\![$ (131b) $]\!]^s$

(132) a. $[_{XP}$ [**not** sure [**not** must $[_{YP}$]]]

b. $[_{XP}$ [**not** sure [must$_1$ **not** t$_1$ $[_{YP}$]]]

c. $[\![$ (132a) $]\!]^s \Rightarrow [\![$ (132b) $]\!]^s$

[41]Caveat: in (132), QR moves *must* into a position with respect to which XP is DE (the composition of negation and *sure*, which is a UE quantifier over possible worlds, yields a DE function). We know for sure that *must* is vulnerable to Anti-additivity, but we cannot rule out the possibility that it is in fact sensitive to downward-entailingness (the reason is that the polarity clash test is negative with *must*, cf. 2.9.2 on p. 109). If it is indeed anti-licensed by DEness, the ban on QR in (132) cannot be blamed unequivocally on laziness.

We can hypothesize that the movement of *must* is blocked when it doesn't yield a logically stronger meaning. Similarly, the addition of *que ce soit*, if it is indeed a domain widener, leads to strengthening only in DE environments, i.e. in those environments where it is licit.

(133) a. *Jean n'a pas compris quelque chose.

b. $\neg\exists x \in D$ (understand'(j,x))

c. Jean n'a pas compris quelque chose que ce soit.

d. $\neg\exists x \in D'$ (understand'(j,x)) with $D \subseteq D'$

e. (133d) $\Rightarrow$ (133b)

(134) a. Jean a compris quelque chose.

b. $\exists x \in D$ (understand'(j,x))

c. *Jean a compris quelque chose que ce soit.

d. $\exists x \in D'$ (understand'(j,x)) with $D \subseteq D'$

e. (134b) $\Rightarrow$ (134d)

To sum up, French has an overt modifier *que ce soit* whose effect is to turn a PPI into an NPI and this transformation comes with domain widening, which is a hallmark of English *any*. I thus venture the hypothesis that *any* in English is nothing but a PPI (either *a* or *some*) salvaged by an analogue of *que ce soit*.[42] *Some* and *any* are thus in complementary distribution because the latter is nothing but a PPI with a modification that is only licit wherever *some* is not.[43] Needless to say, much more work is needed to

[42] *A* is a priori a more natural candidate than *some*, as *any* can be analyzed into a-n-y, where the morpheme -*y* is a ρ modifier (and the intervocalic [n] is euphonic).

[43] The PPI phenomenon is extremely robust across languages: to my knowledge, the unacceptability of indefinites—otherwise acceptable in simple positive sentences—under a clausemate negation is universal. But not all languages have weak NPIs such as English *any* (for example, Italian has n-words, which do not pattern exactly like NPIs).

verify this hypothesis: as a starting point, we need to establish that *a* is anti-licensed in DE environments); furthermore, a challenge awaits us: the smallest possible domain of *some* (PolP) is not the same as the smallest possible domain of *any* for some speakers (it is smaller than PolP), therefore it is unlikely that they are derivationally related.[44]

The benefit of this hypothesis is that it does away with a long-standing puzzle, namely the licensing of *any*. *Any* is the form that a PPI takes when salvaged in DE environments under a certain modification. We are thus left with one question: why are PPIs of the *some*-type anti-licensed in DE environments? The answer to the question of the licensing of *any* will ensue from the answer to this more fundamental problem.

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[44]I want to point out that within English too, a derivational link between PPIs and NPIs is visible (although the resulting NPI is strong):

(i) John didn't understand a THING.

The indefinite is ungrammatical in (i) unless *thing* bears a pitch accent. Interestingly, this accent is ungrammatical outside of AA environments.

(ii) a. ??John understood a THING.
b. ??Fewer than three people understood a THING.
c. ??Exactly three people understood a THING.

A similar phenomenon takes place with the adjective *single:*

(iii) John didn't understand a single thing.

The prominent reading of (iii) is that John didn't understand anything. This meaning is not the expected one: one expects to get the negation of '*John understood a single thing*', which is true e.g. in a situation in which John understood two things. (iii) can be viewed as an exemplification of a ρ modification of the PPI *a thing:* outside of AA environments, *a single thing* only has its literal—exhaustified—meaning, not the non-literal one. Since Lahiri 1998, there is a tradition that views strong NPIs (the ones that require AA environments) as being accompanied with a hidden *even:* the accent on *thing* in (i) might be a phonological marker of the presence of the silent focus particle. We could hypothesize that the presence of *even* is a way to salvage a plain indefinite PPI, and that this salvaging mechanism cannot be used outside of certain environments. One glitch is that the derivational link that I proposed between *any* and *some* made sense insofar as they are in complementary distribution: but *a thing* and *a single thing* are only vulnerable to AA environments, therefore if they derive from a PPI, this PPI has to be anti-licensed in AA environments only. And we haven't established yet that *a* (the natural candidate, also natural for the derivation of *any*) is anti-licensed in AA environments.

2.7 *Some* is not an Intervener

There is a possibility that we haven't excluded yet: so far, all the ungrammatical cases that we've considered involve the PPI *some* in one of the three configurations (assume that the sentences that correspond to these templates contain no other occurrences of PPI, NPI and negation, than the ones explicitly mentioned):

(135) A: *[$_S$ **not** ... [$_{S'}$ some ... any]]

B: *[$_S$ **not** ... [$_{S'}$ ... **not** ... some ... any]]

C: *[$_S$ **not** ... [$_{S'}$ some$_1$ ... **not** ... some$_2$]]

A simple-minded generalization comes to mind, that targets *some* (in A and B) and *some*$_1$ (in C) as the culprit: the quantifier *some* cannot intervene either between an NPI and the closest licenser, or between a negation that anti-licenses a PPI and the closest rescuer of that PPI. Put more simply: *some* cannot intervene between a PI in need of licensing and its potential licenser. I see two ways to make sense of this generalization.

The first one is easily dismissed: one might be tempted to extend Chierchia's (2004) proposal, originally designed to account for so-called intervention effects of *every, and,* numerals, *because*-clauses etc., to *some.* But notice that it is impossible that the disruption effects be due to a scalar implicature: although *some* is a scalar term, it is a weak one (therefore it only triggers a SI in a non-DE environment), and in the cases that we are concerned with, the only constituents where *any* (in A and B) and *some*$_2$ (in C) have a chance of being licensed are DE w.r.t. the position of *some*/*some*$_1$.

The second way goes as follows: *some* creates an intervention, and this intervention has nothing to do with its PPIhood (therefore what I described as polarity clashes are but spurious effects). If we are unable to respond to this challenge, the new data that we produced bring little support to the environment-related hypothesis: in effect,

operator-based hypotheses have been developed that deal with the disruption effects created by *every* and *and* (Beck 2006) and treating *some* as a member of the class of interveners wouldn't be too big a stretch for those theories. Suppose for example that we hypothesize that (i.) an NPI needs to be in the scope of at least one DE operator in order to be licensed (there must be a syntactic dependency between the NPI and the DE operator, i.e. c-command); (ii.) *some* creates an intervention whose result is to break the syntactic dependency that the licensing condition requires. Such a theory cannot explain all the facts that I put forward in favor of the environment-based theory (e.g. the flip-flop data), but it can explain why the presence of *some* between a DE operator and an NPI leads to the anti-licensing of the NPI (in the configurations A and B). Turning to PPIs, suppose that we hypothesize that a negation and a clausemate PPI in its scope turn into an NPI, which requires being in the scope of at least one DE expression to be licensed (see Szabolcsi 2004 for such a theory). If *some* disrupts the licensing of NPIs, configuration C in (135) boils down to a case of anti-licensing of an NPI.

I see at least four reasons to maintain that polarity clashes exist and that they lend support to the environment-based approach: (1.) clashes occur even when *some* is c-commanded by *any*, (2.) other PPIs besides *some* create a clash, (3.) the clash is sometimes mitigated (in circumstances in which the intervention effect is not) and (4.) the clash can be avoided by applying a strategy which also salvages PPIs outside of the multiple-PI configurations.

1. First of all, we can construct configurations where ungrammaticality ensues from the co-occurrence of an NPI and a PPI in that order (these are cases where the PPI cannot act as an intervener because it is lower than the NPI). If we are right in assuming that *some* has PolP as its smallest possible domain, we need to place an NPI in this domain; no DE expression can appear in this domain, because we want to

exclude direct anti-licensing of the PPI as a cause of ungrammaticality. One way to achieve the result is to use a double object construction where the expression denoting the Goal is an NPI and the expression denoting the Theme is a PPI (this is a very simple modification of (109a)). Assuming that the relative scope of the quantifiers at LF remains what it is on the surface (because of scope freezing, cf. Bruening 2001) and that the NPI doesn't raise out of PolP, we expect the result to be bad because all eligible constituents have the same polarity w.r.t. both PIs as the LF shows. This prediction is borne out:

(136) a. *At most five people sold anyone something.

b. (136a): *[$_{\text{TP}}$ ↘1 ↘2 **at most 5 people** T [$_{\text{PolP}}$ ↗1 ↗2 anyone$_2$ something$_1$ sell t_2 t_1]]

With the verb *tell*, we replicate the effect with two PIs of opposite polarity in the same PolP (with both surface orders exemplified in (137a) and (137b)).

(137) a. *At most five people told anyone something.

b. *At most five people told someone anything.

Since *tell* can be constructed with a propositional complement, it offers an interesting testing ground for our hypothesis. The PPI in the embedded clause can be licensed before the NPI in the matrix can be licensed (and (138a) is correctly predicted to be grammatical); however an NPI in the embedded clause cannot be licensed without anti-licensing the PPI in the matrix and *vice versa* (and (138b) is correctly predicted to be ungrammatical):

(138) a. At most five people told anyone that someone had come.

b. *At most five people told someone that anyone had come.

2. Second, other PPIs besides *some*, e.g. *would rather*, create polarity clashes with *any*, witness (139d).[45]

(139) a. He would rather be in Montpelier.

b. *He wouldn't rather be in Montpelier.

c. There isn't anyone here who wouldn't rather do something downtown.

d. *There isn't anyone here who wouldn't rather do anything downtown.

[Baker 1970, ex. 46a]

The NPI *anything* cannot be licensed in the embedded PolP due to the presence of the anti-licensed *would rather;* the next constituents where *would rather* can be licensed (matrix PolP and its superconstituents) are constituents in which *anything* is anti-licensed. Changing the complement of *do* from the NPI *anything* into the PPI *something* (139c) rescues the sentence (all three PIs are licensed on matrix PolP).

(140) a. (139c): [$_{TP}$ T [$_{\boxed{\text{PolP}\ \nearrow 1\ \nearrow 2\ \searrow 3}}$ **not** anyone$_3$ [$_{CP}$ [$_{TP}$ T [$_{\boxed{\text{PolP}\ \searrow 1\ \searrow 2}}$ **not** [would rather]$_2$ something$_1$ do t$_1$]]]]]

b. (139d): *[$_{TP}$ T [$_{\boxed{\text{PolP}\ \nearrow 1\ \nearrow 2\ \searrow 3}}$ **not** anyone$_3$ [$_{CP}$ [$_{TP}$ T [$_{\boxed{\text{PolP}\ \searrow 1\ \searrow 2}}$ **not**

[45] I was not able to find speakers of the dialect in which *would rather* is a PPI. The data are taken from Baker 1970, p. 178: Baker shares the intuition that underlies the present article and proposes a rule of polarity reversal which takes into account all clausemate PIs: 'one polarity-sensitive item in a subordinate clause can have its polarity reversed only if all such elements do.'

Van der Wouden (1997) comments on (139d) (p. 170): he shares the intuition developed in this article, since he suggests that 'an NPI and a PPI must be checked at the same time or under the same construction.' He proposes to view the rescuing facts as a cancellation of negation and explains that the DE operator, being unavailable, cannot license an NPI in its scope (and conversely, without cancellation, the PPI is not available). However he immediately discards what he calls a 'simple story in terms of negation cancellation' in view of the cases where a combination of two DE operators doesn't anti-license an NPI (i.e. lack of flip-flop). The facts that sentences such as (139d) exemplify are left unexplained.

[would rather]$_2$ anything$_1$ do t$_1$]]]]]

3. Third, if we adopt the perspective of theories that hold that *every, always, and,*... act as interveners (i.e. as elements that disrupt the syntactic dependency between an NPI and its licenser) and want to include *some* in the class of interveners, we expect *some* to pattern with the foregoing elements. But it doesn't, and the circumstances in which it fails to cause a disruption have a better chance of falling out from the environment-based approach than from the intervention approach. Let us see why. We've seen that the co-occurrence of *some* and *any* is ungrammatical in the scope of a superordinate negation or negative quantifier, and also in the scope of strictly DE quantifiers. But speakers judge that there is a very significant contrast between those cases (reproduced below as (141)) and (142c), where the PIs co-occur in the restrictor of *if* ((142a) and (142b) are controls). Importantly, (142c) is also significantly better than (143), where *every* replaces *some.* By itself, the latter contrast indicates that the effects induced by *some* and *every* are of a different brand.

(141) a. *I'm not sure that someone stole anything.
b. *No one claims that someone stole anything.
c. *At most five people sold someone anything.

(142) a. If someone stole a camera, we're in trouble.
b. If John stole anything, we're in trouble.
c. ?If someone stole anything, we're in trouble.

(143) *If everyone stole anything, we're in trouble.

The case of *if* is particularly interesting, because it is standardly analyzed as being non-monotonic on its restrictor (Lewis 1973, Heim 1984). It is a well-known fact that

natural language conditionals do not exhibit the monotonicity properties of material implication. For example, the 'Strengthening of the Antecedent' property doesn't hold of natural language conditionals:[46]

(144) Strengthening of the Antecedent: If *if* ϕ, ψ then *if* $\phi \wedge \phi'$, ψ.

(145) If this match were struck, it would light, but if this match had been soaked in water overnight and it were struck, it wouldn't light.

[modified from Stalnaker 1968].

The claim that antecedents of conditionals are non-monotonic faces an empirical challenge: weak NPIs are licensed in them, cf. (142b). If DEness is a necessary condition for NPI licensing, this fact is left unexplained on the non-monotonic line. Heim (1984) noted however that not all antecedents of conditionals license *any,* and she observed that licensing only obtains in the presence of some background assumptions.

(146) a. If you read any newspaper at all, you are well informed.

b. #If you read any newspaper at all, you remain quite ignorant.

It is a commonly shared assumption that reading newspapers is a way of being informed and that the more newspapers one reads, the better one is informed: given the additional assumption, the following entailment holds:

(147) For any n' $>$ n, if you read n newspapers, you are well informed $\Rightarrow$ if you read n' newspapers, you are well informed.

[46] Alternative theories, e.g. von Fintel 1999, have been developed which maintain that conditionals are structures of universal quantification wherein the *if*-clause provides the restrictor: on this view, *if*-clauses are monotonic, more specifically downward-entailing, and appearances to the contrary, cf. (145), ought to be blamed on changing domain restrictions.

The background assumption provides what one might call pseudo-DEness, since we observe in (147) a reversal of the direction of entailment in (148):

(148) For any n' $>$ n, $[\![$ n' newspapers $]\!] \Rightarrow [\![$ n newspapers $]\!]$

There is no plausible background assumption to the effect that the more newspapers one reads, the more ignorant one remains, i.e. no assumption that could make up for the inherent non-monotonicity of *if*-clauses: this explains why (146b) is unacceptable.

Armed with this knowledge, we can now go back to (142c): on the *if*-clause, the environment is strictly speaking non-monotonic for both PIs.

(149) (142c): $[_{TP}$ $[_{\boxed{CP}\boxed{\asymp 1}\boxed{\asymp 2}}$ **if** someone$_2$ anything$_1$ t$_2$ steal t$_1$] T ...]

The PPI *somone* is therefore not anti-licensed; *anything* is not licensed by this environment, but it is licensed in some derivative way, i.e. by the adjunction of the plausible assumption that if we're in trouble if John stole a thing *x*, we're all the more in trouble if John stole *x* and something else; this move secures what I called pseudo-DEness. The question of course is the following: shouldn't pseudo-DEness affect the PPI as well? My answer to this question is at best a tentative one. The fact that (142c) is slightly deviant suggests that simultaneously licensing the two PIs subjects the system to some tension. We can suppose that pseudo-DEness anti-licenses PPIs; the restrictor of *if* is both non-monotonic and (given the right background assumptions) pseudo-DE. When the system checks for the licensing of *some* and *any* in such a constituent, it needs to integrate pseudo-DEness for the latter and ignore it for the former, and avoids a violation of the general licensing condition (73) at the cost of an inconsistency (and this inconsistency is presumably less harmful than a plain violation of the licensing condition).

4. Fourth, there is a way to alleviate the ungrammaticality that arises from the presence of *some* in the scope of a clausemate negation, that we haven't discussed yet (it is not described in the literature, as far as I know). Adding an overt restriction to the restrictor of the quantifier in the form of a relative clause or a reduced relative clause (of which a postnominal adjective is an instantiation) significantly improves the acceptability of *some* (prenominal modification doesn't have the same effect):

(150)	a.	*John didn't hire someone.	*NEG>SOME
	b.	John didn't hire someone that he didn't like.	NEG>SOME
(151)	a.	*I didn't buy something.	*NEG>SOME
	b.	I didn't buy something from Eastern Europe.	NEG>SOME
	c.	*I didn't buy some Eastern European thing.	*NEG>SOME
(152)	a.	*John never invited someone.	*NEG>SOME
	b.	John never invited someone honest.	NEG>SOME
	c.	*John never invited some honest person.	*NEG>SOME

This phenomenon bears resemblance to subtrigging (LeGrand 1975), whereby *any* is acceptable—in a context which is neither negative nor modal or generic—thanks to the presence of a postnominal modification of the restrictor of the quantifier (see Dayal 2004):

(153)	a.	*Any student signed the petition.	
	b.	Any student who went to the meeting signed the petition.	
	c.	Any student at the meeting signed the petition.	
	d.	Any student there signed the petition.	[Dayal 2004, ex. 3]

I won't attempt to offer an explanation of the subtrigging phenomenon (i.e. licensing by modification), but will content myself with proposing that the cases of improvement of *some* that we are considering should be subsumed under it. We expect that subtrigging improves the sentences where the co-occurrence of a PPI and an NPI in all eligible constituents normally leads to unacceptability (provided that it leaves intact the monotonicity of the context and doesn't harm the NPI). This prediction is borne out: there is a correlation between the acceptation of (152b) and the acceptation of (154b) among speakers.[47]

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[47]There is an obvious counterproposal. In all of the above pairs, the second sentence is associated with an inference. For example:

(i) John never invited someone honest.
$\rightsquigarrow$ John sometimes invited someone.

It is possible that this inference is a scalar implicature that derives, through the standard Gricean procedure, from the Maxim of Quantity. Consider (150), (151) and (152); in each of them, the grammatical counterpart of the a. sentence is logically stronger than the b. sentence. For concreteness:

(ii) $\neg\exists x$ [person'(x) $\wedge$ invite'(j,x)] $\Rightarrow$ $\neg\exists x$ [person-honest'(x) $\wedge$ invite'(j,x)]

If the (grammatical counterpart of the) a. sentence is an alternative to the b. sentence, it gives rise to an implicature. Factoring in this scalar implicature (i.e. calculating the strengthened meaning, as in Chierchia 2004) yields a non-monotonic context, and this has the effect of shielding the PPI e.g. in (152b) because all eligible constituents are non-monotonic w.r.t. its position.

(iii) $[\![$ (152b) $]\!]^s$ = $\neg\exists x$ [person-honest'(x) $\wedge$ invite'(j,x)] $\wedge$ $\exists x$ [person'(x) $\wedge$ invite'(j,x)]

The situation is more complex than it looks however: the fact that prenominal modification doesn't salvage PPIs—although it feeds the SI mechanism—suggests that SIs are not in fact at work in the grammatical sentences. Yet, some data seem to support the implicature line. It is possible to salvage *some* without directly modifying its restrictor, as shown in (iv) (Tim Stowell, p.c.), where context and the adverbial *for a change* contribute to making the PPI acceptable. It is plausible that *for a change* triggers the implicature that Mary said something on other occasions.

(iv) (Mary can't help raising her hand to express her views in class. Guess what...)
For a change, she didn't say something.
$\rightsquigarrow$ Mary sometimes said something.

Notice in closing that if a SI salvages the PPI when it is modified postnominally, we expect the NPI to be anti-licensed in (154b). The judgments of the speakers I've polled so far show otherwise.

(154) a. *It is impossible that someone stole anything.

b. ?It is impossible that someone honest stole anything.

Adding a postnominal modifier to the restrictor of *every* doesn't have the same mitigating effect:

(155) *It is impossible that everyone who is honest stole anything.

Summing up, the environment-based approach (specifically the cyclic hypothesis) can be upheld against the potential counter-analysis that I outlined. Operator-based approaches are hard-pressed to explain the new facts introduced in this section, which strongly suggest that polarity clashes are real. After discussing hypothetical analyses, I turn in the next section to the examination of an actual theory, namely Szabolcsi 2004, which departs radically from mine in two important ways: it is operator-based and it reduces PPIhood to NPIhood (while I attempt a symmetric reduction).

2.8 Szabolcsi 2004

Szabolcsi proposes that the commonalities that one observes between PPIs and certain NPIs are not an accident: in her analysis, *some* behaves like a weak NPI when it falls in the immediate scope of an anti-additive operator, i.e. it needs to be licensed. Rescuing—whereby an occurrence of *some* in the so-called immediate scope of a clausemate negation ends up being acceptable only if *some* and the clausemate negation are outscoped by a DE expression—is thus a simple instance of licensing of a weak NPI. Anti-additivity is the logical property that *some*-type PPIs are vulnerable to, i.e. the property that induces the NPI-like behavior; strict DEness leaves *some*-type PPIs unaffected. This rule is supported, in Szabolcsi's view, by the following contrast:

(156) a. No one called someone. *n.s. of SOME

b. At most five people called someone ✓ n.s. of SOME

The explanandum is thus the effect of clausemate anti-additive operators on *some.* Szabolcsi proposes that *some* has two NEG or 'NPI features', and that these NEG features act just like negations: *some* is one possible spell-out of an item which has the semantics of a doubly negated existential $\lambda P \lambda Q \neg\neg\exists[P(x) \wedge Q(x)]$. The higher negative feature can interact with an operator to form a binary resumptive quantifier: but only clausemate anti-additive operators qualify (it is a 'strong-NPI' feature); the lower negative feature can also form a resumptive quantifier with an operator, which only needs to be DE (it is a 'weak-NPI' feature). The operator can be DP-internal, it need not be external, which means that the lower NEG feature can combine with the higher one. The PPI phenomenon is thus reduced to the NPI phenomenon (analyzed as the formation of a resumptive quantifier with an external DE operator). This is one original and appealing feature of the proposal; another one is that there is strictly speaking no licensing or anti-licensing. In this system, *some* and *any* are the mere morphological reflexes of semantic processes whereby negative features combine with operators to form resumptive quantifiers. A third form, namely *no,* is a possible spell-out for the form $\neg\neg\exists$: Postal (2000), whose system is partially inherited by Szabolcsi, underlines that *any* and *no* have one property in common, i.e. they can host exceptives, and for that reason proposes that they are underlyingly identical (he argues that they are both ambiguous between an existential and a negative reading).[48] We have thus a *some-any-no* paradigm, and the choice is controlled by pronunciation rules, which

[48]The important facts are illustrated in the following paradigm:

(i) a. John said nothing but hello.
b. John didn't say anything but hello.
c. At most five people said anything but hello.
d. *John said something but hello.

decide which form gets to be pronounced, depending upon the number of negative features that enter the semantic process and the position of the operator with which the quantifier is formed (Szabolcsi uses the wording ‘is licensed by’ or ‘is deleted by’ as shortcuts for ‘forms a resumptive quantifier with’):

(157) **Szabolcsi’s 2004 pronunciation rules:**

a. one NEG is left in place: pronounce *no;*

b. two NEG’s are left in place: pronounce *some;*

c. no NEG is left in place:

(i) two NEG’s are licensed DP-externally: pronounce *some;*

(ii) elsewhere: pronounce *any.*

Let us look at some examples:

(158) a. John saw something.

b. John didn’t see anything.

c. John saw nothing.

d. It’s impossible that John didn’t see something.

In each of the above four cases, the item that is inserted has the semantics of a doubly negated existential. The derivation of (158a) is as follows: the two NEG features are left in place, and they cancel each other out semantically; *some* is pronounced per (157b). In (158b), the higher NEG feature ‘licenses’ the lower one and sentential negation ‘licenses’ the higher one: *any* gets pronounced per (157cii). In (158c), the

Postal claims that *no* and *any* are ambiguous between a $\neg\exists$ and a $\neg\neg\exists$ construal: the former allows exceptives, while the latter doesn’t. Pronunciation rules determine which of the two forms gets to be pronounced. In the $\neg\exists$ construal, the negative feature is strong (it needs an anti-additive licenser); in the $\neg\neg\exists$ construal, both negations are weak.

higher NEG feature 'licenses' the lower one, and remains in place: *no* is pronounced per (157a). Lastly, in (158d), the higher NEG feature is 'licensed' by clausemate negation and the lower one is 'licensed' by the superordinate DE expression: *some* is pronounced per (157ci). Importantly, this is a failure proof system: the ungrammatical forms are not ruled out after being generated, they are simply not generated. It bears saying that, under those assumptions, there can in fact be no underlying identity between *some* and *any*, by Szabolcsi's own admission (her fn. 32). In effect, the order of the strong and weak NPI features in the underlying representations cannot be the same: in the underlying representation of *some*, it is $\text{NEG}_{strong} > \text{NEG}_{weak}$, because if the weak feature intervened, it would shield the strong one from the external anti-additive licenser (recall that immediate scope is of the essence in this theory). Inversely, in the case of *any*, the higher negation deletes the lower one and remains in place; since it can be licensed by a DE expression, it has to be weak: the order in the underlying representation has to be $\text{NEG}_{weak} > \text{NEG}_{strong}$. This stipulated difference weakens the proposal, as it deprives it of its main appeal, namely the underlying identity between *some* and *any.* It reintroduces gaps in the paradigm: there is no pronunciation rule for the outcome of neg-deletion within the underlying form $\neg_s \neg_w \exists$: the remaining NEG feature is strong, which means that we have a strong NPI in need of an anti-additive licenser; Szabolcsi doesn't say what quantifier this is.

In order to make the system empirically adequate, certain stipulations are in order. First of all, Szabolcsi needs to rule out (159) (for the dialects that do not allow negative concord).

(159) *John didn't see nothing. (unless denial)

Her rule (157a) allows it however: the higher NEG is licensed (deleted) by sentential negation (an anti-additive operator) and the lower NEG is left in place, therefore *no*

should be pronounced. She proposes the following condition:

(160) **The evenness condition on neg-deletion:** Only an analysis with an even number of chained neg-deletions is well-formed.[49]

Second and more importantly, Szabolcsi has to stipulate that the two NPI features of the inserted item—with the semantics $\neg\neg\exists$—cannot be left in place in the immediate scope of an anti-additive operator, i.e. that *some* is not an option. This is certainly unfortunate, as the unavailability of *some* under a clausemate negation is one of the core facts that any theory of PPIs should account for in a principled way. Szabolcsi notices that negation itself is unacceptable under a negative quantifier (unless the sentence is used to express denial):

(161) *No one didn't laugh.

She claims that this observation lends independent support to the following principle (which requires the other stipulation that sentential negation is a strong-NPI feature):

(162) **Activation requirement:** When a strong-NPI feature occurs in the immediate scope of a local anti-additive, it cannot remain unlicensed (unless the anti-additive expresses denial). Resumption is obligatory in this configuration.

[49]This rule doesn't apply to DP-internal deletions, only to 'chained' ones (if I understand this notion of 'chained neg-deletion' correctly): in (i), the higher NEG feature licenses the lower one, and this is the only neg-deletion operation that takes place.

(i) John saw nothing.

(161) is ungrammatical because the only possible output is, per (162), one in which the sentential negation is licensed. Yet another rule, specifically tailored to deal with sentential negation, seems necessary here—Szabolcsi omits to provide it: this rule should stipulate that the pronunciation of sentential negation is empty under an anti-additive operator (since the correct form is *'No one laughed'*). The application of (157cii) should also be blocked.

The invulnerability to non-local anti-additive operators is not derived on principled grounds: Szabolcsi proposes that it follows from the fact that the higher NEG feature in the underlying form of *some* is a strong-NPI feature, and certain strong NPIs require a local licenser (it is a correlation rather than an explanation which is offered). This is indeed true of the strong NPI *in years*, but not of the strong NPIs *yet* or *until* (they all require anti-additive licensers):

(163) a. *It's impossible that John has exercised in years.
b. It's impossible that John can understand this yet.
c. It's impossible that John left until the day after.

An explanation is missing, and the offered correlation is not even perfect, therefore the theory cannot account for this very salient property of PPIs.

In addition to being stipulative on some of its crucial tenets, the theory has also some shortcomings on the empirical front. It cannot account for the data presented and discussed in this article. Specifically, it cannot predict the ill-formedness of the configurations below as it is in essence an operator-based proposal. It is therefore inconsistent with the existence of domains of PIs.

(164) a. *[. . . **not** . . . [$_{TP}$ some . . . any]]
b. *[. . . **not** . . . [$_{TP}$ some . . . [$_{PolP}$ **not** . . . some]]]

c. *[$_{TP}$ [at most five] . . . [$_{PolP}$ . . . some any]]

d. *[$_{TP}$ [at most five] . . . [$_{PolP}$ . . . any some]]

Claiming that (164a)-(164c) are bad because *some* is an intervener is a nonstarter (in Szabolcsi's system, quantifiers that intervene between an operator and an item which contains negative features block the formation of resumptive quantifiers); we have shown that there are good reasons to reject this hypothesis on empirical grounds (one argument actually relies on (164d) shown above), but from the point of view of Szabolcsi's theory itself, it is not a desirable move: while *some* and *any* do not differ in any substantial way according to it (they are both existential quantifiers underlyingly), replacing *some* in each of (164a)-(164c) with *any* leads to a grammatical result. This difference is out of the reach of the theory.

Anti-additivity is not, *pace* Szabolcsi, the property that PPIs are vulnerable to; only a theory which fully takes locality into account can show that this property is in fact downward-entailingness. Since the explanation of the PPI facts crucially relies in Szabolcsi's theory on anti-additivity (as being the licenser of a strong negative feature), the facts discussed here are at variance with it.

2.9 Open Problems

2.9.1 Computations Involving Non-monotonic Quantifiers

We have seen that a PPI anti-licensed by a clausemate negation gets rescued by a DE expression. The explanation that I offered is that the context of the PPI on constituents which include both DE expressions (the anti-licensing one and the rescuing one) is upward-entailing. The environment-based approach was discarded by previous researchers (Bhatt and Schwarz (2003), Szabolcsi (2004)) in favor of an operator-based

approach on the grounds that *some* is not rescued by UE expressions: according to them, *some* is anti-licensed by AA expressions; and the combination of a UE and a AA expressions yields a strictly DE context.

(165) a. ⟦ Eastern-European languages ⟧ ⇒ ⟦ European languages ⟧

b. More than two people don't understand European languages ⇒ More than two people don't understand Eastern-European languages. *(DE)*

c. More than two people don't smoke and more than two people don't drink ⇏ More than two people don't smoke or drink. *(not AA)*

If the acceptability of *some* was checked on its syntactic environment, the objection goes, a UE function should rescue it by creating a DE environment when composed with negation.[50] For example in (166a), PolP is AA, while TP is strictly DE, w.r.t. the position of *something.*

(166) a. *When Fred speaks French, more than two people don't understand something.

b. (166a): *[$_{\text{TP}}$ ↘1 [more than two people] T [$_{\text{PolP}}$ AA 1 **not** something$_1$ t_2 understand t_1]]

This objection has no force since we have established that *some* is in fact vulnerable to DEness instead of Anti-additivity (2.4.1.3).

Opponents to environment-based licensing have also pointed out the lack of rescuing by non-monotonic expressions, and unlike the previous objection, this is indeed a vexing issue. We have established that *some* is not vulnerable to non-monotonicity,

[50] According to Szabolcsi (2004), rescuers can only be DE expressions, i.e. NPI licensers, because a PPI in the 'immediate' scope of a clausemate negation forms a non-lexical NPI with this negation, see 2.8 above.

and the theory defended here does predict that *someone* should not be anti-licensed in (167a), since there is an eligible constituent which is non-monotonic w.r.t. its position, namely TP.

(167) a. *When Fred speaks French, exactly forty-two people don't understand something.

b. (167a): [$_{\boxed{\text{TP}\ \asymp 1}}$ [exactly forty-two people]$_2$ T [$_{\boxed{\text{PolP}\ \searrow 1}}$ **not** something$_1$ t$_2$ understand t$_1$]]

There are reasons however to take the counterargument with a grain of salt. It relies on the universally accepted assumption that speakers make no mistakes in the computation of monotonicity. This assumption might not be fully warranted, though. One can construct a complex expression comprising a negative quantifier such that the context created in its scope is not DE. *Not exactly no one* is an example of such a complex non-DE expression; it is a constituent, therefore it counts as an operator and an operator-based approach must take it into account.[51] Although it creates a non-DE context (in another parlance, it is a non-DE operator), *not exactly no one* anti-licenses PPIs and licenses NPIs:

[51] I assume that *Not exactly no one* is a constituent with the structure [[[not exactly] no] one]. The two alternative constituencies that come to mind are unsatisfactory. First, suppose that *not exactly* is a modifier at the clausal level: [[not exactly] [$_{\text{TP}}$ no one…]]. This makes the wrong prediction that the following sentence is felicitous in the envisaged context:

(i) *Context:* A new legislation is about to be adopted which bans the consumption of alcohol. But there are a few legislative steps remaining. So one can say that at this stage…
#Not exactly no one can drink alcohol.

Second, the constituency [not [[exactly no one] [$_{\text{VP}}$]]] runs into the problem that [[exactly no one] [$_{\text{VP}}$]] is not well-formed.

(ii) #Exactly no one can drink alcohol.

(168) a. $[\![$ red car $]\!] \Rightarrow [\![$ car $]\!]$

b. Not exactly no one has a car.

c. Not exactly no one has a red car.

d. (168b) $\not\Rightarrow$ (168c)

(169) Can you name a time when no one in the family behaved responsibly?

a. *Not exactly no one did something when Mary was in trouble, but she received very little support from her relatives.

b. Not exactly no one did anything when Mary was in trouble, but she received very little support from her relatives.

The truth-conditional meaning of *not exactly no one* is clearly not DE; if it were the following sentence could be uttered truthfully in a context in which students who answer all questions correctly pass the exam (contrary to fact).

(170) If you want to pass the exam, you have to make not exactly no mistakes.

[modified from Nouwen 2006]

There is a solid intuition that it is also non-UE, i.e. that (168c) doesn't entail (168b): the reason is that *not exactly no one has a car* seems to mean that a proportion close (but non equal) to 0% owns a car (I propose that we refer to this component of the meaning of *not exactly* as the proximal component, using a term that is traditionally used in the discussion of the meaning of *almost*, cf. Penka 2005, Nouwen 2006), and one can construct a situation in which a very small proportion of people in the domain own a red car, and a large proportion own a car.

Despite the strength of the intuition, I think one should exert caution here: it is reasonable to think that the proximal component is not truth-conditional, but rather is

a scalar implicature (which I will not try to derive). Now, if *not exactly* denotes a non-monotonic function (i.e. it is neither DE nor UE, truth-conditionally), we are entitled to think that speakers mistakenly treat the composition $f \circ g$ of a non-monotonic function f and a DE function g (the expression that denotes f precedes the expression that denotes g) as being DE. And we thus expect, by parity of reasoning, that they will also treat as DE the context created by *exactly three people* and negation in (167a). Alternatively, if *not exactly* denotes a DE function, we have found an instance in which speakers are unable to compute the composition of two DE expressions (the result is in fact UE): under this hypothesis, we have evidence that speakers can err in their monotonicity computations, and (167a) might have the properties that lead to sub-optimal computing.[52]

Chemla et al. (2010) have established experimentally that the notion relevant for NPI licensing is *perceived* rather than *actual* downward-entailingness: in other words, the licensing condition is rightly phrased in terms of DEness (this notion is indeed operative), but speakers base their judgments on their perception of monotonicity, which is not necessarily accurate. Further experiments are needed to determine whether speakers perceive the context created under *exactly three* and negation as DE, and similarly for the context created by *not exactly no one.* Pending the results of these investigations, it is imprudent to conclude from (167a) that environment-based approaches are on the wrong track. Operator-related accounts (in particular Szabolcsi 2004) don't fare any better than my theory with regard to (169): if *not exactly no one* is indeed a constituent, it counts as an operator and the licensing pattern is not expected given the non-DEness (therefore the non-Anti-additivity) of that operator.

[52]Linear order seems to be of the essence, as we have seen that speakers can compute that the combination of negation and a non-monotonic quantifier creates a non-monotonic context, when negation precedes the non-monotonic-function-denoting expression, cf. (111).

There is another case where the theory defended here incorrectly predicts that a PPI should be rescued: I have in mind sentences where a weak scalar term should rescue a PPI in its scope by triggering a direct SI (this is not a case that opponents to environments have envisaged).

(171) a. When Fred speaks French, someone doesn't understand something.

*n.s. of SOME

b. $[\![(171a)]\!]^s = \exists x\ [person'(x) \wedge \neg\exists y\ [understand'(x,y)]] \wedge$
$\neg\forall x\ [person'(x) \rightarrow \neg\exists y\ [understand'(x,y)]]$

If the direct scalar implicature is incorporated into the meaning that is relevant to licensing (just like indirect scalar implicatures are, cf. section 2.4), sentence (171a) is non-monotonic w.r.t. the PPI, and given our previous conclusions, the PPI should be acceptable on TP. This fact is reminiscent of the lack of anti-licensing by direct scalar implicatures:

(172) a. At most five people people understand anything.

b. *Direct scalar implicature:* Some people understand something.

Chierchia's (2004) solution to this puzzle is, in essence, that direct scalar implicatures are calculated after licensing is checked (in subsequent work, Chierchia derives the facts using two different operators, one for the calculation of scalar implicatures, one for the checking of licensing, cf. Chierchia 2006). Maybe (171a) shows that direct implicatures simply don't enter the computation of licensing of PIs.[53] It might also be that anti-licensing of *some* in (171a) is yet another effect of the failure to perceive as non-monotonic an environment which really is (when the source of non-monotonicity

[53]This line of reasoning is potentially weakened by some facts which suggest that an implicature might play a role in the rescuing of *some*, discussed in fn. 47 on p. 96.

precedes a DE function).

2.9.2 Deontic *must*

In this article, I have used the scopal properties of deontic *must* to make an argument in favor of the computation of PI licensing on syntactic domains. The syntactic scope of *must* w.r.t. negation derives from its being a PPI. We expect to witness a polarity clash with NPIs, of the kind that we observed between *any* on the one hand and *some, still,* and *would rather* on the other. The case in point is (173c) with narrow scope *any*, where all domains on which *any* is licensed are domains that contain a PPI in an anti-additive environment.[54]

(173) a. I don't think that John must$_{deon}$ read.

b. I don't think that John must$_{deon}$ read something.

c. %I don't think that John must$_{deon}$ read anything.

d. I don't think that John has$_{deon}$ to read anything.

The evidence is mixed. Some speakers reject (173c) (for them, the only possible reading of that sentence is one in which the modal is interpreted epistemically; it takes wide scope over negation because epistemic *must* is in their dialect—British English—a neg-raiser as it can take semantic scope over a superordinate negation as in *'I don't think John must be very clever'* interpreted as *'I think that John must not be very clever'*). But a majority accept it. At this stage, I can only offer speculations. First,

[54]A clarification is in order here: the verb *think* is a neg-raiser, i.e. it is optionally and preferentially interpreted as having semantic scope over negation. Under this interpretation, strong NPIs are licensed under *think* as they find themselves in an anti-additive environment (they are not licensed under the non-neg-raised interpretation: in that case the complement of the modal is a DE context, which results from the combination of an anti-additive operator and an upward-entailing universal quantifier over possible worlds.)

focus seems to play a role. It is possible to give deontic *must* narrow scope under negation with a special accent, for example in:

(174) No one MUST vote.[55]

It is possible that speakers save (173c) from ungrammaticality by placing an accent on *must* that I was not able to properly detect or control for. The alternative explanation I would like to offer is that there might be a categorial ingredient to polarity clashes (the NPIs and PPIs we have considered were all phrasal). The lack of clash between *any* and *must* can actually be likened to a symmetric lack of clash between *some* and the NPI modal *need* even when *some* takes wide scope over *need*.

(175) In such a case, all someone need do is go to the police.

2.10 Conclusion

Polarity items are sensitive to the monotonicity of the constituents they appear in, as evidenced by flip-flop, by dependency-related phenomena (polarity clashes), by the effects of scalar implicatures, and by the scope of *must*.

Let us recapitulate the main configurations that illustrate the first two kinds of phenomena (E_{DE} stands for 'DE expression'):

1. Flip-flop:

    1.1 With NPIs (in French and in English$_B$):

[55]This accent cannot give *must* narrow scope under a simple negation:

(i) You MUST not vote. *n.s. of MUST

$$*[_{\text{CP}} \ldots [_{\text{PolP}} \text{E}_{DE}\ \text{E}_{DE}\ [_{\text{CP}} \ldots \pi^{-} \ldots]]] \tag{21}$$

1.2 With PPIs:

a. $[_{\text{CP}} \ldots \text{E}_{DE} \ldots [_{\text{PolP}} \text{E}_{DE}\ \pi^{+} \ldots]]$ (50)

b. $*[_{\text{CP}} \ldots [_{\text{PolP}} \text{E}_{DE}\ \text{E}_{DE}\ [_{\text{CP}} \ldots [_{\text{PolP}} \text{E}_{DE}\ \pi^{+} \ldots]]]]$ (52b)

2. Dependency:

a. $*[_{\text{CP}} \text{E}_{DE} \ldots [_{\text{CP}} \pi_k^{+} \ldots [_{\text{PolP}} \text{E}_{DE} \ldots \pi_l^{+} \ldots]]]$ (64b)

b. $*[_{\text{CP}} \text{E}_{DE} \ldots [_{\text{CP}} \ldots \pi^{+} \ldots \pi^{-} \ldots]]$ (77b)

c. $*[_{\text{CP}} \text{E}_{DE} \ldots [_{\text{CP}} \ldots [_{\text{PolP}} \text{E}_{DE} \ldots \pi^{+} \ldots \pi^{-} \ldots]]]$ (86aii)

d. $[_{\text{CP}} \text{E}_{DE} \ldots [_{\text{CP}} \pi_k^{+} \ldots \text{E}_{DE} \ldots \pi_l^{-} \ldots]]$ (86aiv)

e. $[_{\text{CP}} \text{E}_{DE} \ldots [_{\text{CP}} \ldots \pi^{-} \ldots [_{\text{PolP}} \ldots \pi^{+} \ldots]]]$ (89b)

f. $*[_{\text{CP}} \ldots \text{E}_{DE} \ldots [_{\text{PolP}} \pi^{+}\ \pi^{-}\ ]]$ (109a)

g. $*[_{\text{CP}} \ldots \text{E}_{DE} \ldots [_{\text{PolP}} \pi^{-}\ \pi^{+}\ ]]$ (136a)

Armed with this knowledge, we have established that *some* is vulnerable to downward-entailingness, and is therefore never licensed in the same domains as *any.* This paves the way for a unification of the NPI and the PPI phenomena: in light of some direct evidence from French, I propose that *any* is the spell-out of a modified PPI and that the fundamental puzzle is: why is *some* unacceptable in DE environments?

CHAPTER 3

Presuppositions and NPI Licensing

3.1 Introduction

The view that Negative Polarity Items are sensitive to downward-monotonicity (Fauconnier 1975, 1978, Ladusaw 1979 a.o.) is widely accepted. But certain recalcitrant facts seem to suggest that downward-monotonicity is too strong a requirement, as NPIs are sometimes licensed in environments that are not downward-entailing. This is notoriously true of the environments created by *only, sorry* and *surprise:* they license NPIs, but do not support downward inferences, due to the presuppositions these items trigger. The alternative is the following: either we weaken the downward-monotonicity requirement (this is the position that is generally accepted, explicitly or not: the near consensus is that presuppositions cannot disrupt the licensing of NPIs), or we maintain it and look for cases where presuppositions break downward-monotonicity and, as a result, disrupt the licensing of NPIs. Unlike most previous researchers, I explore the second route and show that NPI licensing in the scope of *only, sorry* and *surprise* is the exception, not the rule. Not that non-disruptive presuppositions are rarer than disruptive presuppositions (if anything, it seems that the opposite is true). But the fact that we can produce examples where NPIs are anti-licensed in the presence of a presupposition confirms that downward-monotonicity is the right notion for NPI licensing and suggests that the explanandum are the cases of *apparent* innocuousness of presuppositions.

In section 3.2, I present the problem, i.e. the availability of certain NPIs in the scope of presupposition triggers. In section 3.3, I explore the full realm of presuppositions and show that some of them, e.g. the presuppositions of cognitive factives and 'too/also' in French and certain dialects of English, disrupt the licensing of weak NPIs (i.e. NPIs of the *any*-type); nearly all presuppositions disrupt the licensing of so-called strict NPIs (i.e. NPIs of the *in years*-type). I conclude that presuppositions are potential disruptors of NPI licensing, in the same way as another kind of inferences, namely scalar implicatures. Section 3.4 refutes a proposal which consists in defining a kind of entailment that preserves downward-monotonicity—and ensures NPI licensing—in the presence of presuppositions: this weakening strategy is defended in von Fintel 1999 and in much subsequent work (with certain important amendments). A new pictures emerges, which I outline in 3.5: it seems that there exist implicational hierarchies, i.e. if a given presupposition disrupts the licensing of weak NPIs, it also disrupts the licensing of strict NPIs. To account for the patterns I bring to light and for this generalization, I hypothesize that presuppositions are detachable parts of meaning that are incorporated in stages into the global meaning of the sentences in which they are triggered: the lack of disruption with certain triggers is due to the fact, I submit, that their presuppositions are not yet incorporated into the global meaning at the moment when licensing is checked. Section 3.6 reviews Gajewski 2009, a theory which adopts von Fintel's weakening strategy but claims that strict NPIs are vulnerable to presuppositions (this is a theory which is based on a subset of the data explored here).

3.2 The Apparent Innocuousness of Presuppositions

The distribution of Negative Polarity Items is known to be restricted to certain configurations, a paradigmatic example of which is the scope of negation. The observation that NPIs can appear in a variety of configurations where negation doesn't seem to be

involved, such as the antecedent of a conditional or the restrictor of *every*, has inspired the hypothesis that what NPIs are sensitive to is a logical property, namely Downward-entailingness, i.e. the capacity to reverse the direction of entailments (Fauconnier 1975, 1978, Ladusaw 1979). To define it, we need a generalized notion of entailment (the entire discussion in this article is set in a trivalent framework):

(1) **Cross-categorial Entailment ($\Rightarrow$) in a trivalent framework:**

a. For p, q of type <t>: p $\Rightarrow$ q iff whenever p = 1, q = 1.

b. For *f*, *g* of type <σ, t>: $f \Rightarrow g$ iff for all x of type σ: f(x) $\Rightarrow$ g(x).

Using cross-categorial entailment, we define Downward-entailingness:

(2) **Downward-entailingness:** A function *F* whose type ends in *t* is Downward-entailing (DE) iff for all A, B in the domain of *F* such that A $\Rightarrow$ B, *F*(B) $\Rightarrow$ *F*(A), where '$\Rightarrow$' stands for cross-categorial entailment as defined in (1).

Let's assume for the time being that NPIs are subject to the following licensing condition:

(3) **The Fauconnier-Ladusaw Licensing Condition:** An NPI is only grammatical if it is in the scope of an α such that $[\![\alpha]\!]$ is DE.

This condition appears to be too restrictive, because it fails to predict that NPIs are available in the scope of operators which are not DE, e.g. the functions denoted by the presupposition triggers *sorry*, *surprise* and *only*.

(4) *Context:* John was informed that Mary just bought a car.[1]

a. John is sorry that Mary bought any car.

b. *Presupposition of (4a):* John believes that Mary bought a car.

(5) *Context:* John is complaining to Meredith that there is not enough light in his hotel room.

a. Meredith is surprised that John has any complaints about the hotel.

b. *Presupposition of (5a):* Meredith believes that John has complaints about the hotel.

(6) *Context:* John has friends in Chicago.

a. Only John has any friends in Chicago.

b. *Presupposition of (6a):* John has friends in Chicago.

These facts are surprising. Consider for example (4a): DE functions allow inferences from sets to subsets, but the inference from (7a) to (7b) doesn't go through.

(7) $[\![\text{Honda}]\!] \Rightarrow [\![\text{car}]\!]$

a. John is sorry that Mary bought a car.

Presupposition: John believes that Mary bought a car.

b. John is sorry that Mary bought a Honda.

Presupposition: John believes that Mary bought a Honda.

c. (7a) $\not\Rightarrow$ (7b)

d. (7b) $\not\Rightarrow$ (7a)

[1] In this example and in the rest of the article, I supply contexts in order to avoid unacceptability due to a presupposition failure. I also spell out presuppositions; for ungrammatical sentences, I provide a grammatical paraphrase and its presupposition.

Although the set of Hondas is a subset of the set of cars, one can easily imagine scenarios in which John is sorry that Mary bought a car, and the only car she bought is a Mazda (in which case (7b) is undefined and there is no entailment, as per (1)). The same pattern recurs with *surprise* and *only:* DEness doesn't obtain but weak NPIs are licensed. The heart of the problem is the presence of presuppositions. Looking at English weak NPIs (*any, ever, care to, bother with*), it is tempting to think that presuppositions are *never* a source of disruption for their licensing, which means, given our hypotheses, that they don't interfere with the DEness of licensers. What's more, triggers like *only* and the emotive factive predicates *sorry* and *surprise* are so far from being disruptors that they even appear to license weak NPIs. We are going to subject the following generalization, which is generally believed to hold, to a critical examination:

(8) **Standard Generalization:** Presuppositions never disrupt the licensing of English NPIs.

The next section shows that the generalization is incorrect: there is clear evidence that certain presuppositions disrupt the licensing of NPIs.

3.3 Disruption by Presuppositions

In this section, I focus on French and on certain dialects of English, and I do two things: (i.) I show that weak NPIs are vulnerable to certain presuppositions and (ii.) I show that a proper superset of those presuppositions disrupt the licensing of strict NPIs.

Most of the data presented in this section are new, because unlike previous researchers I do not restrict my attention to the case of expressions that are both pre-

supposition triggers and NPI licensers (e.g. *only*): I also examine the disruptive power of presuppositions triggered by items that intervene between an NPI and a potential licenser. This choice is justified in the first subsection.

3.3.1 In Defense of Environment-based Licensing

Although many researchers adopt the Fauconnier-Ladusaw view that the licensing condition should be phrased in terms of Downward-entailingness, there is no real consensus as to what it is that must be downward-entailing, or in other words, what it is that licenses NPIs. Once DEness is accepted, licensing can be viewed in two different ways: either as a relationship between a DE operator and an NPI in its scope (I propose to dub this view, which is essentially syntactic, the operator-based approach), or as the match between the demands of the NPI and the properties of the constituents it finds itself in (henceforth the environment-based approach).

For the operator-based approach (Szabolcsi 2004, Guerzoni 2006, Guerzoni and Sharvit 2007 a.o.), the contribution to meaning of expressions other than licensers is not important. This is not the case for the environment-based approach, which takes into account the meaning of the constituent(s) a given NPI appears in: therefore the presuppositions triggered by licensers as well as the presuppositions triggered by other expressions in the syntactic environment of the NPI matter.

In Homer 2010a (Chapter 2 of this dissertation), I show that operator-based approaches are inadequate and that the environment-based approach is correct: what matters to the licensing of polarity items is the monotonicity of their syntactic environment. The licensing condition that I will substantiate is the following:

(9) **Licensing Condition (modified after Gajewski 2005):** An NPI α is licensed in a sentence S only if there is an eligible constituent β of S containing α

such that β is DE w.r.t. the position of α.[2]

(10) A constituent β is DE with respect to the position of α ($[\![\alpha]\!] \in D_\sigma$) iff the function $\lambda x.[\![\ \beta[\alpha/v_\sigma]\ ]\!]^{g[v_\sigma \rightarrow x]}$ is DE.

The data that we turn to lend direct support to the environment-based approach and against the operator-based approach. In effect, the presupposition of cognitive factive verbs and of the additive particle *too* are monotonicity-breakers and as such disrupt the licensing of weak NPIs (in French and some dialects of English).

3.3.2 French Weak NPIs

I provide data that directly challenge both the operator-based approach and the standard generalization (8). They bring to light the disruptive effect of two presuppositions in particular, i.e. the presupposition triggered by French cognitive factives (3.3.3) and by the additive particle *aussi* 'too/also' (3.3.4). I need to say a word in preamble about the data that I am about to present: these are French rather than English data. The English speakers I surveyed have strong and robust judgments, but there is a considerable amount of dialectal variation: for a first category of speakers (dialect A), cognitive factive predicates are not disruptive but *too/also* is; for a second category (dialect B), neither are disruptive. In French, I found no variation on the key sentences that make up the paradigm. The only benefit of looking at French data is that in that language both categories of triggers are disruptive.[3]

[2]This condition mentions 'eligible constituents' because it incorporates the lesson drawn from Homer 2010a that the verification of licensing is not possible on just any constituent, e.g. the licensing of a strict NPI cannot be verified on a constituent that doesn't contain Pol (the Polarity head, which hosts in its specifier a negative operator, when the sentence is negative, or nothing otherwise).

[3]One potential disadvantage is that it is in principle possible—but not very probable—that the workings of cognitive factive predicates and additive particles in the two languages are different, maybe too dissimilar to permit a fruitful comparison.

Like English *any, quoi que ce soit* is licensed in the scope of negation, negative quantifiers (over individuals and times), DE determiners, antecedents of conditionals, yes-no questions, etc.:

(11) a. *Jean n' a jamais critiqué quoi que ce soit.*
Jean NEG has ever criticized what that this be.SUBJ

b. *Personne n' a critiqué quoi que ce soit.*
nobody NEG has criticized what that this be.SUBJ

c. *Au plus cinq personnes ont critiqué quoi que ce soit.*
at most five people have criticized what that this be.SUBJ

d. *Jean critique rarement quoi que ce soit.*
Jean criticizes rarely what that this be.SUBJ

e. *Si tu critiques quoi que ce soit, tu seras renvoyé.*
if you criticize what that this be.SUBJ you be.FUT fired

f. *A-t- il critiqué quoi que ce soit ?*
has he criticized what that this be.SUBJ

It is also licensed in the scope of the licensers/triggers equivalent of *only DP* and in the complement clause of the equivalent of *surprise* and *sorry* (although it is degraded in the latter case):

(12) a. *Seul Jean a compris quoi que ce soit.*
only Jean has understood what that this be.SUBJ

b. *Je suis surpris que Jean ait compris quoi que ce soit.*
I am surprised that Jean have.SUBJ understood what that this be.SUBJ

c. ?*Je regrette que Jean ait critiqué quoi que ce soit.*
I regret that Jean have.SUBJ criticized what that this be.SUBJ

3.3.3 Presupposition of Cognitive Factives

However, *quoi que ce soit* (and all other NPIs) in the complement clause of a French cognitive factive predicate like *savoir* 'know', *réaliser* 'realize', *se rendre compte* 'become aware', *découvrir* 'find out', etc. cannot be licensed by a superordinate licenser[4] (this is also true in another dialect of English, let us call it dialect C, which is partially described in Fitzpatrick 2005 and to which I had no direct access):

(13) *Context:* Marie read a novel.

a. **Jean ne sait pas que Marie a lu quoi que ce soit.*
Jean NEG knows NEG that Marie have.IND read what that this be.SUBJ
Intended: *'Jean doesn't know that Marie read anything.'*

b. Jean ne sait pas que Marie a lu quelque chose (*'something'*).

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[4]I hasten to say that this generalization doesn't hold of conditionals (e.g. *'Si Jean découvre que…'* 'if Jean finds out that…'); but these are a special case, as they notoriously allow for a non-presuppositional usage of *découvrir* 'find out'. NPIs are perfectly licit only if the presupposition of *découvrir* is not triggered.

A caveat: outside of conditionals, *savoir* and *know* have a non factive usage, which requires a first person subject (ia). In French a non factive usage of *savoir* 'know' with a first person subject is only possible with subjunctive morphology on *savoir* (this fact is all the more intriguing because matrix subjunctive is normally impossible) and on the embedded verb (ib). NPIs are licensed in the complement of *sache* (ii):

(i) a. I don't know that Mary knows this person.
b. *Je ne *sais/sache pas que Marie connaisse cette personne. (French)*
I NEG know.IND/SUBJ NEG that Marie know.SUBJ this person

(ii) *Je ne sache pas que Marie ait quelque chance que ce soit de gagner.*
I NEG know.SUBJ NEG that Marie have.SUBJ some chance that this be.SUBJ to win

The cases of NPI licensing that interest us in dialects A and B of English are observed without restriction to the verb *know* with a first person subject: they appear in uncontroversially factive environments, such as (iiia):

(iii) *Context:* Mary is the best player in the tournament.

a. John doesn't know/realize that Mary has any chance to win.
b. *Presupposition of (iiia):* Mary has some chance to win.

c. *Presupposition of (13b):* Marie read something.

If the polarity of the factive presupposition triggered by the embedding verb is negative (it is positive in the above example), no disruption occurs, therefore the polarity of the presupposition rather than the mere existence of a presupposition is the source of the unavailability of NPIs. Putting a negation in the complement of the factive predicate changes the polarity of the presupposition:

(14) *Context:* Marie didn't read anything.

a. *Jean sait que Marie n' a pas lu quoi que ce soit.*
Jean knows that Marie NEG has NEG read what that this be.SUBJ
'Jean knows that Marie didn't read anything.'

b. *Presupposition:* Marie didn't read anything.

When the verb *penser* 'think', which is not a presupposition trigger, is substituted for the verb *savoir* 'know', no disruption occurs:[5]

(15) a. *Jean ne pense pas que Marie a/ait lu quoi que ce soit.*
Jean NEG thinks NEG that Marie have.IND/SUBJ read what that this be.SUBJ
'Jean doesn't think that Marie read anything.'

b. *Presupposition:* None.

In the same connection, the cognitive factive verb *se souvenir* 'remember' allows the indicative/subjunctive alternation when negated. The indicative yields the presupposition that the complement clause is true, and acts as a disruptor—provided there is no

[5]In French (unlike in Italian), the indicative can be used in the complement clause of a negated epistemic predicate without triggering a factive presupposition, see Homer 2007 and section 3.3.5.1 on p. 134.

negation in the embedded clause—while the subjunctive doesn't yield this presupposition and is not a disruptor:

(16) *Context:* Marie warned Jean against drinking alcohol.

a. **Jean ne se souvient pas que Marie lui a dit quoi*
Jean NEG REFL remembers NEG that Marie to-him have.IND said what
que ce soit.
that this be.SUBJ
'Jean doesn't remember that Marie told him anything.'

b. Jean ne se souvient pas que Marie lui a dit quelque chose (*'something'*).

c. *Presupposition of (16b):* Marie said something to Jean.

(17) a. *Jean ne se souvient pas que Marie lui ait dit*
Jean NEG REFL remembers NEG that Marie to-him have.SUBJ said
quoi que ce soit.
what that this be.SUBJ
'Jean doesn't remember that Marie told him anything.'

b. *Presupposition:* None.

To sum up, French cognitive factives act as disruptors between an NPI and a potential licenser. The source of the disruption appears to be the factive presupposition they trigger: the polarity of the presupposition itself is of the essence, which suggests that the presupposition is factored into the meaning that is relevant for NPI licensing. Let us verify that (13a) is ungrammatical because it doesn't contain any constituent that is DE w.r.t. the position of the NPI: the only constituents that contain a DE expression (i.e. a potential licenser) are superconstituents of the matrix NegP. We can thus restrict our attention to these constituents (and for ease of exposition, I propose that we examine the entire sentence).

(18) *Jean ne sait pas que Marie a lu quoi que ce soit.

a. $[\![\text{novel}]\!] \Rightarrow [\![\text{book}]\!]$

b. Jean ne sait pas que Marie a lu un livre.

(Jean NEG know NEG that Marie has read a book)

Assertion: Jean doesn't have the belief that Marie read a book.[6]

Presupposition: Marie read a book.

c. Jean ne sait pas que Marie a lu un roman.

(Jean NEG know NEG that Marie has read a novel)

Assertion: Jean doesn't have the belief that Marie read a novel.

Presupposition: Marie read a novel.

d. (18b) $\not\Rightarrow$ (18c) *(not DE)*

To ascertain whether (18) is DE in the position of the NPI, we must verify that (18b) entails (18c) (in this pair of sentences, the position of the NPI is occupied by DPs whose denotations stand in a set-to-subset relation), i.e. that whenever (18b) is true, (18c) is true too. Presuppositions project under negation: the presupposition of *savoir* contributes a positive proposition to the meaning that is relevant for licensing. The situations in which (18b) is true are situations in which it is defined (that is, in which the presupposition triggered by *savoir* is satisfied). But it is not the case that all the situations in which (i.) Jean doesn't know that Marie read a book and (ii.) Marie read a book are situations in which Marie read a novel. In other words, there are situations in which (18b) is true but (18c) is undefined (has value #). By virtue of (1), (18b) doesn't entail (18c), and we make the correct prediction that *any* is not available in (18) because its environment is not DE.

[6]For reasons of simplicity, I assume that the assertive content of *know* is that of an epistemic predicate. In my paraphrase, I use the phrase *have the belief* instead of *think* or *believe*, which are neg-raising predicates and are therefore not appropriate, since *know* is not neg-raising, cf. Gajewski 2005.

Remarkably, we can infer downward in the position of the NPI if only the assertive component of the meaning is taken into account to the exclusion of the factive presupposition (the assertive component of (18b) entails the assertive component of (18c)): the presupposition is therefore the cause of the anti-licensing of the NPI. By themselves, the cognitive factive verbs *savoir, se souvenir, se rendre compte*, etc. are not potential NPI licensers (they do not invert the direction of entailments in their complement); and they do not create an intervention, in the sense that their mere presence doesn't break a syntactic dependency (witness the minimal pair (16a)-(17a)). But the presupposition they trigger when they occur between an NPI and a potential licenser (negation in the case at hand) has a disruptive potential. We have thus found an instance where the presence of a presupposition ruins the monotonicity of the context of an NPI, leading to anti-licensing.

These facts are at variance both with the operator-based approach (the contribution of expressions other than licensers matters to licensing) and with the standard generalization (8) (some presuppositions are disruptive).

The next section reaches the same conclusions using a different presupposition trigger, namely *aussi* 'too/also'.

3.3.4 Presupposition of *aussi*

3.3.4.1 Comparing *aussi* and *non plus*

Observe the pair formed by (19) and (20a): they differ in the choice of the indefinite (a plain one in the former, and an NPI in the latter). *Aussi* is an anaphoric presupposition trigger, and as such, its presupposition must be satisfied in the linguistic context.

(19) *Context:* Marie read a novel.

Marie a lu un roman, mais je ne pense pas que [Jean]$_F$ ait
Marie has read a novel but I NEG think NEG that Jean have.SUBJ
lu quelque chose lui aussi.
read something him too

'Marie read a novel, but I don't think that [Jean]$_F$ read something too.'

(20) *Context:* Marie read a novel.

a. **Marie a lu un roman, mais je ne pense pas que [Jean]$_F$*
Marie has read a novel but I NEG think NEG that Jean
ait lu quoi que ce soit lui aussi.
have.SUBJ read what that this be.SUBJ him too

Intended: *'Marie read a novel but I don't think that [Jean]$_F$ read anything too.'*

b. Marie a lu un roman mais je ne pense pas que Jean ait lu quelque chose ('something') lui aussi.
Presupposition of (20b): Somebody other than Jean read something.

Now compare the ungrammatical (20a) with the grammatical (21a) below:

(21) *Context:* Marie didn't read anything.

a. *Marie n' a rien lu, et je ne pense pas que [Jean]$_F$*
Marie NEG has nothing read, and I NEG think NEG that Jean
ait lu quoi que ce soit lui non plus.
have.SUBJ read what that this be.SUBJ him either

'Marie didn't read anything, and I don't think that [Jean]$_F$ read anything either.'

b. *Presupposition:* Somebody other than Jean didn't read anything.

What the above sentences show is that *aussi* 'too' is a disruptor while *non plus* 'either' is not. Crucially, the ungrammaticality of (20a) is not due to some incompatibility between *aussi* and the superordinate negation, as shown by the acceptability of (19).

This discrepancy is all the more significant because *aussi* and *non plus* are minimally different: both are focus particles,[7] and as such they associate with a constituent and evoke a set of alternatives. One pertinent difference between the two triggers concerns the polarity of their presuppositions (compare the presupposition of (20b), which is the closest grammatical paraphrase of (20a), and the presupposition of (21a)). Let us now show that this difference is indeed relevant (and operative in the contrast) only if the conservative licensing condition defended here (9) is in effect (i.e. the constituent on which the licensing is checked has to be DE w.r.t. the position of the NPI). The verification relies on the following inference schema.

(22) *Je ne pense pas que $[\text{Jean}]_F$ ait lu quoi que ce soit lui aussi.

a. $[\![\text{novel}]\!] \Rightarrow [\![\text{book}]\!]$

b. Je ne pense pas que $[\text{Jean}]_F$ ait lu un livre lui aussi.
(I NEG think NEG that Jean have.SUBJ read a book him too)
Assertion: I don't think that Jean read a book.
Presupposition: Somebody other than Jean read a book.

c. Je ne pense pas que $[\text{Jean}]_F$ ait lu un roman lui aussi.
(I NEG think NEG that Jean has read a novel him too)
Assertion: I don't think that Jean read a novel.
Presupposition: Somebody other than Jean read a novel.

d. (22b) $\not\Rightarrow$ (22c) *(not DE)*

[7] Focus itself cannot be at fault, because a focused element that is not associated with a focus particle is innocuous:

(i) Marie a lu un roman mais je ne pense pas que $[\text{Jean}]_F$ ait lu quoi que ce soit.

Given that *aussi* triggers a presupposition, the situations in which (22b) is true are situations in which it is defined (that is in which the presupposition triggered by *aussi* is satisfied). But it is not the case that all the situations in which (i.) I don't think that John read a book and (ii.) someone other than John read a book are situations in which somebody other than John read a novel. In other words, there are situations in which (22b) is true but (22c) is undefined (has value #). The entailment doesn't hold.

The same procedure for checking the monotonicity of the position of the NPI applies, mutatis mutandis, to (21a).

(23) Je ne pense pas que $[\text{Jean}]_F$ ait lu quoi que ce soit lui non plus.

a. $[\![\text{novel}]\!] \Rightarrow [\![\text{book}]\!]$

b. I don't think that $[\text{Jean}]_F$ read a book either.

Assertion: I don't think that Jean read a book.

Presupposition: Somebody other than Jean didn't read a book.

c. I don't think that $[\text{Jean}]_F$ read a novel either.

Assertion: I don't think that Jean read a novel.

Presupposition: Somebody other than Jean didn't read a novel.

d. (23b) $\Rightarrow$ (23c) *(DE)*

Whenever the premise (23b) is true, hence defined, the consequence (23c) is defined too (the presupposition of the former entails the presupposition of the latter). Furthermore, the assertive content of (23b) entails the assertive content of (23c). Therefore (23b) entails (23c) per (1): we have verified that the position of the NPI is one with respect to which the sentence is DE. This derives the availability of the NPI, as desired.

Given the difference between *aussi* and *non plus*, it is clear that the mere presence of a presupposition trigger in the licensing environment of the NPI is not sufficient to

cause a disruption. The presupposition causes anti-licensing only if it ruins the monotonicity of the context (this requires that the presupposition is formed using linguistic material which encompasses the position of the NPI, as is the case in (20b) and (21a)).

3.3.4.2 NPIs Licensed in the Focus of *aussi*

Other facts can be adduced that show that the source of the disruption is indeed the presupposition of *aussi*. There is at least one position in the sentence that the presupposition of *aussi* doesn't make non-monotonic, namely its own focus (in the syntactic sense of the word *focus*); and as expected, this is a position where a weak NPI is licensed. The presupposition of *aussi* makes a negative contribution to the meaning in relation with the focused element (this is important, since we know that a negative contribution of a presupposition is necessary for licensing, cf. the presupposition of *non plus* (21a)).

(24) a. [Mary]$_F$ invited a student too.

Presupposition: $\exists x[x \neq m \wedge \exists y[y \in [\![\text{student}]\!] \wedge \text{invite'}(x,y)]]$

b. Mary invited [a student]$_F$ too.

Presupposition: $\exists x[x \notin [\![\text{student}]\!] \wedge \text{invite'}(m,x)]$

For concreteness, consider this example, where an NPI is available in the scope of *aussi* (it differs from the ungrammatical (20a) in that the NPI is in the focus of the particle):

(25) *Context:* Marie invited Pierre, who is not taking any classes with anyone.

a. *Je ne crois pas que Marie ait aussi invité [qui que ce*
I NEG think NEG that Marie have.SUBJ also invited who that this

soit de la classe de Jean]$_F$.
be.SUBJ of the class of Jean
'I don't think that Marie invited [anyone in Jean's class]$_F$ too.'

b. *Presupposition:* Marie invited someone who is not in Jean's class.

(26) a. ⟦ French student ⟧ ⇒ ⟦ student ⟧

b. I don't think that Marie invited [a student]$_F$ too.

Assertion: I don't think that Marie invited a student.

Presupposition: Marie invited someone other than a student.

c. I don't think that Marie invited [a French student]$_F$ too.

Assertion: I don't think that Marie invited a French student.

Presupposition: Marie invited someone other than a French student.

d. (26b) ⇒ (26c) *(DE)*

The assertion of the premise entails the assertion of the consequence of the downward inference above. In contrast with the other case we considered earlier (22), the presupposition of the former entails the presupposition of the latter (if Marie invited someone who is not a student, she necessarily invited someone who is not a French student): therefore the entailment goes through (as per (1)). The complexity of the facts brought to light here makes a class of possible analyses untenable, namely an explanation in terms of intervention by focus.

3.3.4.3 Not an Intervention by Focus

The theories I have in mind are based on the fact that *aussi* is a focus particle. In other words (here I follow the influential tradition initiated by Jacobs (1983) and Rooth (1985)) *aussi* relates the value of the focused expression to a set of alternatives. The focus semantic value of a sentence is the set of propositions obtainable from the ordinary semantic value by making a substitution in the position corresponding to the

focused phrase. For sentence (27a), these alternatives are of the form 'that x solved a problem' with x an individual (following standard practice, I write as $[\![S]\!]^o$ the ordinary semantic value of sentence S (the proposition expressed by the sentence) and as $[\![S]\!]^f$ its focus value).

(27) a. $[\text{Mary}]_F$ solved a problem too.

b. $[\![(27a)]\!]^o = \lambda$w. mary solved a problem in w

c. $[\![(27a)]\!]^f = \lambda$p$\exists$x[p = λw.x solved a problem in w]

Now, it is a priori conceivable (and this line is actually pursued in Kim 2002, Beck 2006), that there exists a ban on any configuration at LF in which a focus particle and its associate intervene between an NPI and its licenser (I write as O the licenser, as $\sim$ the focus-sensitive operator, e.g. *also* or *even*, as α the associate of the particle).

(28) *O[$\ldots \sim$C[$_\Phi \ldots \alpha_F \ldots$ NPI]]

But such a ban simply doesn't seem to hold. Notice first that the particle causes a disruption even when its associate does not c-command the NPI: in (29a), the associate of *aussi, la musique,* is in the complement of the noun *intérêt* 'interest', therefore it is c-commanded by the NPI (the actual position of *aussi* itself is a lot harder to determine, but the argument can be made even if it is not known precisely; I use the NPI *quelque NP que ce soit* which has the same distributional properties as *quoi que ce soit*).

(29) *Context:* Edith is a movie lover.

a. **Je ne pense pas qu' elle ait quelque intérêt que ce*
I NEG think NEG that she have.SUBJ some interest that this
soit pour [la musique]$_F$ aussi.
be.SUBJ for the music too
Intended: *'I don't think that she has any interest in [music]$_F$ too.'*

b. *Je ne pense pas qu' elle ait de l' intérêt pour [la*
I NEG think NEG that she have.SUBJ of the interest for the
musique]$_F$ aussi.
music too
'I don't think that she has interest in [music]$_F$ too.'

c. *Presupposition of (29b):* Edith has some interest in something other than music.

The associate of *aussi* does not c-command the NPI at LF in (29a); it is not clear that *aussi* c-commands the NPI. Even if it does, it won't do to propose a stricter rule in replacement of (28) so as to prohibit c-command of the NPI by the focus particle (whether or not the associate c-commands the NPI):

(30) *O[. . . ∼C[$_\Phi$. . . NPI]]

The reason is that we already know that this amended rule is bound to be too restrictive, because in (25a) repeated as (31) for convenience, the focus particle c-commands the NPI (assuming that association with *aussi* requires c-command), and the result is grammatical:

(31) *Context:* Marie invited Pierre, who is not taking any classes with anyone.

Je ne crois pas que Marie ait aussi invité [qui que ce
I NEG think NEG that Marie have.SUBJ also invited who that this
soit de la classe de Jean]$_F$.
be.SUBJ of the class of Jean

A more general and radical claim can be made: since NPIs are available in the scope of *aussi* under certain circumstances (i.e. when focused, cf. (31)), the ungrammaticality of (20a) is not due to an *intervention* effect. In other words, the mere presence of *aussi* between a licenser and the NPI is not a source of disruption. This rules out any syn-

tactic accounts according to which NPIs are anti-licensed when their dependency w.r.t. their potential licenser(s) is interrupted by the presence of a certain operator. Guerzoni 2006 is one such account (although it doesn't predict that an NPI should always be anti-licensed in the presence of an intervener: there are two possible sources of licensing in this account, namely phrasal movement and feature movement: it suffices that one of the two routes is available for the NPI to be licensed).

Summarizing, the disruption effect of *aussi* (and of *too/also* in the dialects of English which exhibit the disruption effect) is correctly predicted if we take into account its presupposition in the computation of the monotonicity of the NPI's environment (see also Appendix II (3.8.2) where I show that we also predict the distribution pattern of subject NPIs). Alternatives based on focus or on syntactic intervention are inadequate. Therefore it is natural to conclude that there exists yet another genuine case of disruption by presupposition.[8]

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[8]As I said earlier, in Homer 2010a I show that polarity items are licensed on an environment basis. One of the tests uses positive and negative polarity items in the same clause. Certain such configurations lead to ungrammaticality, because a PI π is licensed in sentence S only if there is a constituent γ of S in which π is acceptable and all other PIs in γ are licensed within γ: the opposite demands of a PPI (*some*) and of an NPI (*any*) can create a clash, e.g. in (i):

(i) *I don't think that someone stole anything.

In light of this fact, it is natural to wonder if *aussi* is not a PPI. This, one might propose, could be a source of disruption (perhaps the only one). It doesn't seem that *aussi* (similarly *too/also*) is a PPI, though (see Rullmann 2003 for an in-depth analysis of the question, which also concludes that *too* is not a PPI):

(ii) *J' ai invité Pierre, mais je ne vais pas aussi inviter [Marie]$_F$.*
I have invited Pierre but I NEG go NEG also invite Marie
'I invited Pierre but I will not also invite [Marie]$_F$.'

Furthermore, the pattern of disruption is not one that the PPI hypothesis would predict. In effect, disruption should occur whenever the NPI is in the scope of *aussi:* but we have seen that an NPI in the focus of *aussi* is not anti-licensed (31).

The position of the NPI in the sentence is crucial. This is directly predicted by the environment-based approach that I advocate. I repeat here for convenience my licensing condition, which is conservatively phrased in terms of Downward-entailingness (as opposed to some weaker notion of entailment, cf. section 3.4):

(32) **Licensing Condition (after Gajewski 2005):** An NPI α is licensed in a sentence S only if there is an eligible constituent β of S containing α such that β is DE w.r.t. the position of α.[9]

3.3.5 Further Evidence for Disruption with Weak and Strict NPIs

So far, the only presuppositions whose disruptive power has been evidenced are the presuppositions of *aussi* and French cognitive factives (certain English exhibit the

[9]We also predict that if the presupposition is not formed using a constituent where the NPI appears, no disruption can occur. Consider the following sentence (i), where a definite description takes intermediate scope between negation and *any*:

(i) *Context:* There is a unique contextually salient semantics professor.
I don't think the semantics professor read anything interesting.
Presupposition: There is a unique contextually salient semantics professor.

The availability of the NPI is expected, since the presupposition of the consequence is identical with the presupposition of the premise (it entails itself) in the following downward reasoning:

(ii) I don't think the semantics professor read anything interesting.

a. I don't think the semantics professor read a book.
b. I don't think the semantics professor read a novel.
c. (iia) $\Rightarrow$ (iib)
Presupposition of (iia) and (iib): There is a unique contextually salient semantics professor.

I assume that presuppositions are generally formed using linguistic material of the sentence their triggers appear in. The presupposition triggered by a definite description is not formed using the nuclear scope of the definite article. Therefore the presupposition of *the* cannot be a disruptor of the licensing of an NPI in its nuclear scope. Things are very different in the restrictor, cf. section 3.8.1.

same effects). In Appendix I (3.8.1), I show that there is reason to think that the presupposition associated with definite descriptions is disruptive too. But it is clear that not all presuppositions are disruptive (we already know that the presuppositions of *only* and emotive factives, cf. (4a), (5a) and (6a) are not, as far as weak NPIs are concerned), and this fact could lead one to think that a more careful investigation will reveal that the effects were wrongly blamed on presuppositions. One should not jump to this conclusion too hastily, though.

There are other cases of disruptive presuppositions with weak NPIs in French and Italian (3.3.5.1). And once we broaden our perspective, cases of disruption abound, in English as well as in French: nearly all presuppositions disrupt the licensing of *strict* NPIs (3.3.5.2).

3.3.5.1 Weak NPIs in French and Italian

In Italian, an epistemic predicate, when negated, tends to require the subjunctive mood in the embedded clause; the indicative is also possible though, but in this configuration, it triggers the presupposition that the speaker holds true the complement clause (see Homer 2007 for details). The following pair shows that the indicative, unlike the subjunctive, disrupts the licensing of the NPI *mai* 'ever':

(33) *Context:* Maria has visited Paris several times.

a. **Gianni non pensa che Maria è mai andata a Parigi.* *(Italian)*
Gianni NEG thinks that Maria be.IND ever gone to Paris
'Gianni doesn't think that Maria has ever been to Paris.'

b. Gianni non pensa che Maria è andata a Parigi.

c. *Presupposition of (33b):* The speaker believes that Maria has been to Paris.

(34) a. *Gianni non pensa che Maria sia mai andata a Parigi.*
Gianni NEG thinks that Maria be.SUBJ ever gone to Paris
'Gianni doesn't think that Maria has ever been to Paris.'

b. *Presupposition:* None.

It is the presupposition triggered by the indicative in (33a) that anti-licenses *mai*.

Both in French and in Italian, the disruptive effects of presuppositions are also felt with the counterparts of the triggers *why* and *how* (while NPIs are normally licensed in questions):

(35) *Context:* Marie wrote three letters to her mother.

a. **Pourquoi/ Comment Marie a-t- elle écrit quoi que ce soit à*
why/ how Marie has she written what that this be.SUBJ to
sa mère ? *(French)*
her mother
'Why/How has Marie written anything to her mother?'

b. Pourquoi/Comment Marie a-t-elle écrit quelque chose ('something') à sa mère ?

c. *Presupposition of (35b):* Marie wrote something to her mother.

Compare with English:

(36) *Context:* Marie wrote three letters to her mother.

Why/How did Mary write anything to her mother?

Presupposition: Marie wrote something to her mother.

Interestingly, *pourquoi* and *comment* do not always trigger a presupposition: they do when the clausemate verb is in the indicative mood (as in (35b)), but they don't when it is in the infinitive or in the conditional mood, as in (37a) below (the same holds in English too). The disruption effect correlates exactly with the presence of a presuppo-

sition in French:

(37) a. *Pourquoi/ Comment Marie écrirait- elle quoi que ce soit à*
why/ how Marie write.COND she what that this be.SUBJ to
sa mère ? (French)
her mother
'Why/How would Marie write anything to her mother?'

b. *Presupposition:* None.

On the other hand, other presuppositions do not disrupt the licensing of weak NPIs in French and Italian: this is true of the presupposition of the equivalent of *only, surprise, sorry* and also of the presupposition of *it*-clefts, of the equivalent of *again* (38) and of superlatives.

(38) *Context:* Pierre is mad at Marie because she asked him to help her with her homework.

Je doute que Marie demande à nouveau de l' aide à qui que ce soit.
I doubt that Marie ask.SUBJ again of the help to who that this be.SUBJ
'I doubt that Marie will again ask help from anyone.'

Presupposition: Marie asked someone for help in the past.

To summarize, the above facts are interesting in two respects: they lend support to the claim that presuppositions can disrupt the licensing of weak NPIs, and they also bring to light the selectivity of the phenomenon: even in French, the presuppositions of some but not all triggers have a disruptive effect on weak NPIs. Consonant with these two conclusions is the fact, established in the next section, that strict NPIs are vulnerable to a greater number of presuppositions.

3.3.5.2 Strict NPIs

Besides weak NPIs, e.g. *any* and *ever,* there exist strict NPIs, whose distribution is more constrained. This category includes such items as *in years,* punctual *until, yet, half bad, all that,* etc.[10] Strict NPIs are so called because their licensers (= the functions that create suitable environments for them) are a proper subset of the licensers of weak NPIs. While the functions denoted by *at most N* and *if* create an environment that licenses NPIs *any* and *ever,* they fail to license strict NPIs e.g. *in years:*

(39) a. At most five people saw anyone.
b. If you see anything, the blindfold is not covering your eyes properly.
c. No one saw anything.
d. Paul didn't see anything.

(40) a. *At most five people have seen John in years.
b. *If you have seen John in years, you know that he quit smoking.
c. No one has seen John in years.
d. Paul hasn't seen John in years.

An intuition shared by many researchers is that licensers vary in negative strength: informally, *at most N* is 'less' negative than *no* or *not.* Under this premise the weak/strict dichotomy can be viewed as a reflection of the particular requirements of the items: a strict item requires a 'more' negative environment than a weak one. Zwarts (1998) provides an algebraic account of these differences based on De Morgan's Laws.

[10] I do not discuss items associated with the lowest degree on a scale, e.g. *lift a finger, sleep a wink, give a rat's ass, have the faintest idea, budge an inch, bat an eyelash,* etc. These idioms are commonly referred to as 'minimizers'. It is not clear that these are NPIs sensu stricto: it is conceivable that the controlling factor of their distribution—which is more restricted than that of weak NPIs—is the presupposition of a hidden *even* that accompanies them (Heim 1984, Guerzoni 2004 a.o.).

(41) **Negative Strength:**

Anti-additive
Downward-entailing (i) $f(\mathrm{X}) \vee f(\mathrm{Y}) \Rightarrow f(\mathrm{X} \wedge \mathrm{Y})$ (ii) $f(\mathrm{X} \vee \mathrm{Y}) \Rightarrow f(\mathrm{X}) \wedge f(\mathrm{Y})$
(iii) $f(\mathrm{X}) \wedge f(\mathrm{Y}) \Rightarrow f(\mathrm{X} \vee \mathrm{Y})$

(42) **Anti-additivity:** A function f is Anti-additive (AA) iff $(f(\mathrm{X}) \wedge f(\mathrm{Y})) \iff f(\mathrm{X} \vee \mathrm{Y})$. [Zwarts 1998]

It can be shown that all Anti-additive functions are DE, but not the reverse. According to Zwarts, strict NPIs must be licensed by an AA function: we verify that *no* is an AA function, while *at most N* is not, by way of examples:

(43) a. No student smokes or drinks $\iff$ No student smokes and no student drinks. *(AA)*

b. At most five students smoke or drink $\Rightarrow$ At most five students smoke and at most five students drink.

At most five students smoke and at most five students drink $\not\Rightarrow$ At most five students smoke or drink. *(not AA)*

Since Zwarts's original licensing condition is phrased in terms of operators, we need to modify it so that it accommodates environments:

(44) **Licensing Condition for Strict NPIs:** A strict NPI α is licensed in a sentence S only if there is an eligible constituent β of S containing α such that β is AA w.r.t. the position of α.

(45) A constituent β is AA with respect to the position of α ($[\![\alpha]\!] \in D_\sigma$) iff the function $\lambda x.[\![\ \beta[\alpha/v_\sigma]\ ]\!]^{g[v_\sigma \rightarrow x]}$ is AA.

Just like weak NPIs, strict NPIs are vulnerable to the presupposition of *too/also* (in all dialects of English and in French):

(46) *Context:* Mary left the next day.

*I don't think that [Kevin]$_F$ left until the next day too.

(47) *Context:* Edwin works out three days a week.

*I don't think that [Kevin]$_F$ has exercised in years too.

(48) *Controls:*

a. I don't think that Kevin left until the next day.

b. I don't think that Kevin has exercised in years.

While weak NPIs are licensed in the cleft-clause of negated *it*-clefts (cf. 3.4.3 for a detailed discussion of the presupposition of *it*-clefts), strict NPIs are not:

(49) *Context:* Mary left on Monday, she could have stayed longer and taken the train with us on Tuesday.

a. I don't think that it was John who did anything that ruined the reunion, it was Mary.

Presupposition: Someone did something that ruined the reunion and if it was John then no one else did.

b. *I don't think that it is John who left until Tuesday, it is Mary.

And unlike weak NPIs, strict NPIs in the scope of the trigger *again* are unlicensed:

(50) a. *Context:* Eve had Chinese food last night, and developed an intolerance to monosodium glutamate.

Eve won't eat any Chinese food again. ✓NEG > AGAIN > ANY

Presupposition: Eve ate Chinese food in the past.

b. *Context:* Last time Eve came over for dinner, she decided to sleep over but because of the poor transportation system in my area, she arrived late at work the next morning.

Eve won't leave until the next day again. *NEG > AGAIN > UNTIL

Furthermore, strict NPIs are also not available in the scope of those expressions which are licensers of weak NPIs and presupposition triggers at the same time, namely *only* and emotive factives (unlike the previous data, these facts have already been noticed, cf. Horn 1989, Atlas 1996, Nathan 1999, Rullmann 2003, Gajewski 2005, Giannakidou 2006; only the latter two analyze them as anti-licensing by presuppositions). Consider first *only:*

(51) a. Only John saw anything.

b. *Only John has exercised in years.

c. *Only John left until the next day.

As far as emotive factives are concerned, we need to exert some caution. Some strict NPIs seem to be sensitive to the locality of their licenser: in particular, *in years* fails to be licensed by superordinate negations (unless the embedding predicate is a neg-raiser, e.g. *think*):

(52) *Context:* John has become so fat…

a. I don't think that John has exercised in years.

b. *It is impossible that John has exercised in years.

c. It is impossible that John did any kind of exercise.

Our examples should thus be controlled carefully. We are interested in licensers which are at the same time presupposition triggers. It is safe to choose verbs which embed infinitive clauses (licensing appears to be easier in infinitives in general).[11] The NPI *until* is perfect under the non-trigger *refuse* but unacceptable under the triggers *sorry, regret* and *surprise.*

(53) a. John refuses to leave until the next day.

b. *John is sorry to have left until the next day.

c. *John regrets to have left until the next day.

d. *John is surprised to have arrived until the next day.

In all the above cases, the presence of a presupposition makes the context of the polarity item non DE. If the presupposition is not incorporated, i.e. if we only consider the assertion, all the NPIs are in a DE environment, which is also Anti-additive. With *it*-clefts, *too* and *again,* this is particularly easy to see: they have no semantics of their own, they are identity functions, and contribute a presupposition. With the trigger-licensers, things are more complex, as their assertive content is harder to single out. The following lexical entry for *only* is generally accepted (but see Giannakidou 2006 for a discussion):

(54) $[\![$ [only α] P $]\!] \neq$ # only if $\alpha \in$ P;

if not #, = 1 iff there is no x $\neq \alpha$ such that x $\in$ P.

[11] The examples used in the literature involve tensed clauses:

(i) *I didn't go to Spain. I regret that I went to [Portugal]$_F$ either. [Rullmann 2003, ex. 29j]

If we adopt this lexical entry, the context of the NPI is AA (if the meaning does not include the presupposition), as can be verified intuitively:

(55) No one who is not John smokes or drinks $\Longleftrightarrow$ No one who is not John smokes and no one who is not John drinks. *(AA)*

Factoring in the presupposition ruins the strict Anti-additivity of the context (because it ruins its DEness, cf. (41)):

(56) a. Only John drinks or smokes.
Presupposition: John drinks or smokes.
b. Only John drinks and only John smokes.
Presupposition: John drinks and smokes.
c. (56a) $\not\Leftrightarrow$ (56b)

Regarding adversative predicates, I follow von Fintel (1999) who builds upon the conditional semantics proposed originally for *want* by Heim (1992) (I only go over *sorry*, but a similar analysis can be given for other adversatives, such as *surprise*). Intuitively, *sorry* expresses a negative preference against a certain proposition. It thus quantifies over possible worlds and establishes a ranking among sets thereof. We need first to define two parameters that will give us a modal base and an ordering on this base (in the case of *sorry*, the latter is the set of propositions that constitute the preferences of the subject of the verb):

(57) a. The 'modal base function' f is a function from pairs of an individual and a world to a set of worlds.
b. The 'ordering source function' g is a function from pairs of an individual

and a world to a set of propositions.

Since we want to model a negative preference, we need to define a strict partial order on worlds:

(58) For any set of propositions P, $<_P$ is a strict partial order:
$\forall$w', $\forall$w": w'$<_P$w" iff $\forall$p$\in$P (w"$\in$p $\rightarrow$ (w'$\in$p $\wedge$ $\exists$p'$\in$P(w'$\in$p' and w"$\notin$p')))
In words: w' is better than w" according to P iff all propositions in P that hold in w" also hold in w' but some hold in w' that do not also hold in w".

(59) For a given strict partial order $<_P$ on worlds, the selection function $\max_P$ selects the set of $<_P$-best worlds from any set X:
$\forall$X$\subseteq$W: $\max_P$(X) = {w$\in$X: $\neg\exists$w'$\in$X:w'$<_P$w }
In words: $\max_P$(X) is the set of worlds w in X such that no other world in X is better than w according to P.

With this in hand, we define the lexical entry of *sorry:*

(60) $[\![$ sorry $]\!]^{f,g}$(p)(α)(w) $\neq$ # only if (i) DOX(α, w) $\subseteq$ p;
(ii) DOX(α, w) $\subseteq$ f(α, w);
(iii) f(α, w) $\cap$ p $\neq \emptyset$;
(iv) f(α, w) – p $\neq \emptyset$;
if not #, = 1 iff $\forall$w'$\in\max_{g(\alpha,w)}$f(α,w): w'$\notin$p
(where DOX (α, w) is the set of worlds compatible with α's beliefs in w)

The assertion of *sorry* is that the proposition p it embeds is true of none of the worlds that comprise the set of the best worlds according to the ordering source (the subject's preferences). *Sorry* presupposes that p is held true by the subject (this is the factive

presupposition), that the modal base properly contains the set of doxastic alternatives, and that in the modal base there are p as well as non-p worlds. The assertive content of *sorry* creates an AA environment: in essence, *sorry* is a negative universal quantifier, and we have already shown that negative universal quantifiers have this property, by the example of *no* (43a).

Factoring in the presupposition ruins the strict Anti-additivity of the context (because it ruins its DEness):

(61) a. Mary is sorry that John drinks or smokes.

Presupposition: Mary believes that John drinks or smokes.

b. Mary is sorry that John drinks and Mary is sorry that John smokes.

Presupposition: Mary believes that John drinks and Mary believes that John smokes.

c. (61a) $\not\Leftrightarrow$ (61b)

It thus appears that it is the incorporation of the presupposition which, in all the above cases, is fatal to the NPIs.[12] It seems to me that the fact that presuppositions have a disruptive effect on strict NPIs lends additional plausibility to the claim defended here

[12]While weak NPIs are licensed in the complement of an English cognitive factive predicate under a superordinate negation (in certain dialects at any rate, cf. (iiia) in fn. 4 on page 120, and (ia) below), a strict NPI is unacceptable in this context:

(i) a. John doesn't realize that Mary has any chance to win.
b. *John doesn't realize that Mary left until the next day.

The unacceptability of strict NPIs in the complement of negated cognitive factives provides yet another argument in favor of an environment-based approach to their licensing. Under an operator-based approach, the fact remains mysterious: negation is the best licenser there is. It is therefore the presence of the predicate which causes a problem.

But under the Anti-additive hypothesis, it is hard to tell whether the presupposition attached to the embedding verb is the direct cause of the disruption, since there is no AA context for the NPI, even if the assertion alone is taken into consideration. Assuming that we can paraphrase this assertive content using the predicate *have the belief,* we can verify intuitively that the context is not AA because the right-to-left direction of the equivalence that defines Anti-additivity doesn't hold:

and usually rejected[13] that presuppositions can disrupt the licensing of weak NPIs.

Having said this, I must make clear that it would be too extreme to say that *all* presuppositions disrupt the licensing of strict NPIs in English. There is at least one notable exception, namely superlatives.

(62) a. John is the best student I have ever interviewed.

b. John is the best student I have interviewed in years.

c. The tallest girl John had seen until Friday walked in the room.

[Gajewski 2005, ex. 207]

(63) $[\![\text{the}\ldots\text{-est}]\!](P)(Q)(\alpha) \neq \#$ only if $Q(\alpha)=1$;

if $\neq \#$ $= 1$ iff $\forall x \neq \alpha\ (Q(x)=1 \rightarrow \iota d P(x)(d) < \iota d' P(\alpha)(d'))$

The assertive content creates an AA environment in the restrictor (as can be shown using a paraphrase in terms of negative universal quantification), and this is not surprising, given the occurrence of strict NPIs. In other words, if the presupposition is not taken into account, the context of the NPI is AA, and licensing is expected.

(64) John is the best student I have interviewed in years.

No student who is not John is as good as John in this or that class $\Longleftrightarrow$ No student who is not John is as good as John in this class and no student who is not John is as good as John in that class. *(AA)*

(ii) *John doesn't realize that Mary left until the next day.

John doesn't have the belief that Mary smokes and John doesn't have the belief that Mary drinks $\not\Rightarrow$ John doesn't have the belief that Mary smokes or drinks.

[13]Giannakidou (2006) is an exception but she claims that presuppositions are always disruptive, which we have shown to be incorrect.

Before closing, I still need to show what the data are in French. It proves to be difficult to find strict NPIs, the best I know is temporal *de tout* (literally 'of all'). The pattern is the same as in English (I illustrate with *aussi* (65a), *regretter* 'regret' (65b), *seul* 'only' (65c), *it*-clefts (65d) and superlatives (65e)):

(65) a. **Jean a parlé plusieurs fois hier, mais je ne crois pas*
Jean has spoken several times yesterday but I NEG believe NEG
que [Pierre]$_F$ ait lui aussi parlé de toute la journée.
that Pierre have.SUBJ him too spoken of all the day

'John spoke several times yesterday, but I don't think that John also spoke at some point during the day.'

b. **Je regrette d' avoir dormi de toute la nuit.*
I regret to have slept of all the night
'I regret sleeping at some point during the night.'

c. **Seul Jean s' est entraîné de toute la journée.*
only Jean SELF is trained of all the day
'Only John worked out at some point during the day.'

d. **Je doute que ce soit Jean qui se soit plaint de toute l' année.*
I doubt that it be.SUBJ Jean who SELF be.SUBJ complained of all the year
'I doubt that it is Jean who complained at some point during the year.'

e. *Jean est le seul étudiant à avoir parlé en classe de toute l' année.*
Jean is the only student to have spoken in class of all the year

'Jean is the only student who spoke in class at some point during the year.'

In Tables 3.1 and 3.2, I summarize the disruption data in English and in French. A star means that the presupposition is disruptive, a checkmark signals that it isn't; IE stands for 'insufficient evidence' (for example, for cognitive factives, it is impossible to tell if the unavailability of strict NPIs is due to the lack of Anti-additivity or to the presupposition they carry; the subscript A in e.g. $\checkmark_A$ signals that the datum is

about dialect A). I also include definite articles (the argument that shows that their presupposition is disruptive is given in Appendix I (3.8.1)).

	Why/How	*Cognitive factives*	*Definite articles*	*Both*	*Too*	*Regret*
Weak NPIs:	✓	✓	*	*	$*_A/✓_B$	✓
Strict NPIs:	IE	IE	*	*	*	*

	Surprise	*Only*	*It-cleft*	*Again*	*Superlatives*
Weak NPIs:	✓	✓	✓	✓	✓
Strict NPIs:	*	*	*	*	✓

Table 3.1: Licensing Disruption in English

	Why/How	*Cognitive factives*	*Definite articles*	*Both*	*Too*	*Regret*
Weak NPIs:	*	*	*	*	*	✓
Strict NPIs:	IE	IE	*	*	*	*

	Surprise	*Only*	*It-cleft*	*Again*	*Superlatives*
Weak NPIs:	✓	✓	✓	✓	✓
Strict NPIs:	*	*	*	*	✓

Table 3.2: Licensing Disruption in French

3.3.6 Disruptive Inferences

The claim that components of meaning other than the assertive content can have a disruptive effect on NPIs has a precedent. Chierchia (2004) made a parallel claim about scalar implicatures. It has been known since Linebarger 1980, 1987 that the presence of certain quantifiers (e.g. *every, always*), of numerals, of *because*-clauses and of conjunction between an NPI and the closest DE expression above it causes the

anti-licensing of the NPI.

(66) a. *When Fred speaks French, John doesn't always understand anything.

b. *When Fred speaks French, not everyone understands anything.

c. *When Fred speaks French, it's not the case that everyone understands anything.

d. *John didn't understand anything because it was easy but because he is smart.

e. *John didn't drink wine and any soda.

Compare with:

(67) a. I doubt that anyone understood anything.

b. John didn't drink wine or any soda.

Chierchia observes that the so-called interveners have something in common: they are all strong scalar terms (i.e. items that sit at the strong end of a Horn scale). In DE contexts, these scalar terms trigger an indirect scalar implicature (indirect SI). This inference breaks the monotonicity of the *environment* of the NPI when added to the literal meaning.

(68) a. I doubt that Sue has any potatoes.

b. *I doubt that every housemate of Sue has any potatoes.

(69) I doubt that every housemate of Sue has potatoes.

Implicature: Some housemate of Sue has potatoes (=It's not the case that I doubt that some housemate of Sue has potatoes).

Let's assume that the meaning that is relevant for NPI licensing is what Chierchia calls the 'strong meaning' (the output of the function written $[\![\cdot]\!]^s$), i.e. the conjunction of the assertive content and of the scalar implicatures. We compute the strong meaning of the whole sentence (69), so as to encompass the verb *doubt* (i.e. the only DE expression available):

(70) $[\![(69)]\!]^s = \neg\forall x \exists y[\text{potatoes'}(y) \wedge \text{have'}(x, y)] \wedge$
$\exists x \exists y[\text{potatoes'}(y) \wedge \text{have'}(x, y)]$

And we verify that the NPI in (68b) doesn't occur in an environment which is DE w.r.t. its position (by checking the set-to-subset inference):

(71) $[\![\text{ blue potatoes }]\!] \Rightarrow [\![\text{ potatoes }]\!]$

a. I doubt that every housemate of Sue has blue potatoes.

b. $[\![(71a)]\!]^s = \neg\forall x \exists y[\text{blue\_potatoes'}(y) \wedge \text{have'}(x, y)] \wedge$
$\exists x \exists y[\text{blue\_potatoes'}(y) \wedge \text{have'}(x, y)]$

c. $[\![(69)]\!]^s \not\Rightarrow [\![(71a)]\!]^s$

This proposal (which I sketched very superficially) is obviously environment-based, like the one defended here: its is the meaning—a meaning that incorporates certain inferences—of the constituent where licensing is checked that matters.

The facts brought to light in the present article lend additional support to Chierchia's original claim and more generally to semantic-pragmatic analyses of so-called intervention effects on NPIs (and against purely syntactic proposals, e.g. Guerzoni 2006). They also show that a unification is possible between apparently disparate phenomena (the disruption caused e.g. by universal quantifiers on the one hand, and the disruption caused by *too/also* on the other): operator-based approaches such as

von Fintel 1999 (cf. 3.4) and Gajewski 2009 (cf. 3.6) inevitably miss this generalization. Orthogonal unification attempts appear to be on the wrong track: Beck (2006) in particular wants to unify intervention effects in *wh*-questions (in Korean, Malayalam, German, etc.[14]) and the intervention effects on NPIs known since Linebarger 1980 by incriminating focus; the cases studied in the present article are not amenable to an analysis in terms of focus (this is evident for cognitive factives for example) even when focus particles are at play (the demonstration is given in 3.3.4.3 about *aussi* 'too/also'; a certain property of *too* seems to affect *wh*-phrases in situ; its presupposition is apparently not at fault, but I leave this question to future research), therefore this enterprise stands no chance of accounting for the novel data of this article, and cannot explain all the disruption effects on NPIs: it seems to me that it is nipped in the bud.

Summary

This section has shown that, contrary to what is generally assumed (8), some presuppositions disrupt the licensing of weak NPIs. It has also shown that all presuppositions except that of superlatives disrupt the licensing of strict NPIs.

In the next section, I show that the lack of disruption with certain presuppositions (e.g. the presupposition of *only*) is due to the fact that the meaning that is taken into account for the purpose of licensing doesn't incorporate those presuppositions.

[14]Here are examples of intervention effects on *wh*-phrases in situ:

(i) a. **Minsu-man nuku-lûl po-ass-ni?* *(Korean)*
Minsu-only who-ACC see-PAST-Q
'Who did only Minsu see?'

b. **Lili-yum eete pustakam-aane waayikk-ate.* *(Malayalam)*
Lili-also which book-be read-NOM
'Which book did Lili, too, read?'

c. ??*koi nahiiN kyaa paRhaa.* *(Hindi)*
anyone not what read-PERF.M
'What did no one read?' [Beck 2006, ex. 1]

I argue against von Fintel's (1999) alternative proposal which holds that the notion of entailment that is relevant for NPI licensing is such that presuppositions are never monotonicity-breakers. We already know, in view of the multiple cases of disruption by presupposition that we have put forth, that such a proposal, if empirically adequate, is necessarily limited in scope; a close inspection reveals that it is in fact not grounded at all (3.4.3).

3.4 Against Strawson-entailment

In this section, I show that the only promising explanation for the innocuousness of certain presuppositions with certain NPIs is that the meaning that is relevant for the licensing of those NPIs doesn't incorporate those presuppositions. This position is new. I defend it against von Fintel's (1999) influential proposal, which I present in (3.4.1). It is based on so-called Strawson-entailment which ensures that NPIs are licensed in the presence of presuppositions. The previous section has presented data that are genuine counterexamples to von Fintel's approach (as I show in 3.4.2): this approach cannot be generalized because disruption by presupposition does exist.

If we were to stop there, the conservative approach which I advocate and which rides on strict DEness, and von Fintel's approach which relies on Strawson Downward-entailingness, are in a tie, as neither has a full empirical coverage. The former predicts—unless it is modified along the lines of (3.5.2)—that all presuppositions disrupt the licensing of all NPIs;[15] the latter predicts that no presuppositions disrupt the licensing of any NPIs (the exceptions to one approach substantiate the other). The tie is only apparent: I show in the third part of the section (3.4.3) that Strawson-entailment has no linguistic reality at all.

[15]Except of course the presuppositions that are not monotonicity-breakers, e.g. that of *either*.

3.4.1 The Notion of Strawson-entailment

The literature on NPIs and presuppositions has always focused on trigger-licensers such as *only* and emotive factives, e.g. *sorry.* Given this restricted set of data, the puzzle is: how can we maintain that weak NPIs need a DE function while they are licensed in the scope of functions that are not DE (they carry presuppositions which make them non-DE in a strict sense; they are not upward-entailing either, witness (7d) on p. 115: they are therefore non-monotonic, strictly speaking)? The natural hypothesis is that *sorry, surprise* and *only* denote DE functions in some sense, despite some appearances to the contrary.

Two main theoretical avenues have suggested themselves to explain the apparent innocuousness of presuppositions:

i. Presuppositions are ignored in the computation of licensing, i.e. they don't enter the computation. We'll refer to this strategy by means of the maxim: *Ignore presuppositions!* (my coinage);

ii. Presuppositions are neutralized in the computation of licensing, i.e. they do enter the computation but entailment is calculated in such a way that they do not break monotonicity. Here the maxim is: *Neutralize presuppositions!* (my coinage).

The first strategy is upheld in Ladusaw 1979. Von Fintel (1999) cites Ladusaw about the implicative *fail,* which licenses weak NPIs despite triggering a conventional implicature—following Karttunen and Peters (1979), I assume that conventional implicatures are nothing but presuppositions—and being as such non-monotonic:

(72) John failed to buy any shirt.

a. $[\![\text{ red shirt }]\!] \Rightarrow [\![\text{ shirt }]\!]$

b. John failed to buy a shirt.

Presupposition: John attempted to buy a shirt.

c. John failed to buy a red shirt.

Presupposition: John attempted to buy a red shirt.

d. (72b) $\not\Rightarrow$ (72c)

Ladusaw holds that presuppositions are detachable parts of meaning, and that only the assertive content is relevant to NPI licensing:

> 'Since entailment depends only upon truth-conditional meaning, it will be true that [(72b)] entails [(72c)], even though that intuition is confused by the fact that [(72c)] implicates something that is not implicated or entailed by [(72b)]. [(72b)] implicates that John tried or was expected to buy a shirt, but [(72c)] implicates that he tried to buy a red shirt. The implicature is irrelevant to the question of whether [(72b)] entails [(72c)].'
>
> [Ladusaw 1979, p. 160]

Assuming that *fail* makes in essence the same truth-conditional contribution as negation, it is easy to verify that it is in fact a DE operator, should attention be restricted to assertion alone for the purpose of licensing:

(73) John failed to buy a shirt.

a. *Assertion:* John didn't buy a shirt.

b. *Presupposition:* John attempted to buy a shirt.

The second strategy, which I christened *Neutralize presuppositions!*, is upheld in von Fintel 1999. Von Fintel refuses to examine the entailments of a sentence in a situation that makes it undefined. He therefore takes issue with Ladusaw's proposal to consider

assertion alone in the assessment of entailment:

> 'It just isn't good methodology to base a semantic theory on judgments about the truth of a sentence in a situation where it would be misleading and inappropriate to assert the sentence.' [von Fintel 1999, p. 103]

Here is how neutralization works, intuitively. Going back to example (4a), repeated here for convenience, it would suffice for the inference to hold that the presupposition of the consequence (74d) is granted, i.e. that it is part of contextual knowledge that John believes that Mary bought a Honda. Under this assumption, the inference is truth-preserving: whenever (74c) is true, (74d) is also true, since its definedness is taken care of.

(74) a. John is sorry that Mary bought any car.

b. $[\![\text{Honda}]\!] \Rightarrow [\![\text{car}]\!]$

c. John is sorry that Mary bought a car.

Presupposition: John believes that Mary bought a car.

d. John is sorry that Mary bought a Honda.

Presupposition: John believes that Mary bought a Honda.

e. (74c) $\not\Rightarrow$ (74d) *(not DE)*

f. (74d) $\not\Rightarrow$ (74c)

This is exactly the move von Fintel (1999) makes to account for the above facts: granting the presuppositions of the consequence will secure Downward-entailingness.

(75) **Strawson Downward-entailingness:** A function f of type $<\sigma,t>$ is Strawson Downward-entailing (SDE) iff for all x, y of type σ such that $x \Rightarrow y$ <u>and $f(x)$ is defined</u>: $f(y) \Rightarrow f(x)$.

According to von Fintel, the licensing condition given in (3) is simply too strong to be empirically adequate. He thus advocates the following formulation (this amounts to taking as licensers a proper superset of DE operators):

(76) **Von Fintel's 1999 Licensing Condition:** An NPI is only grammatical if it is in the scope of an α such that $[\![\alpha]\!]$ is SDE.

It is immediately clear that this condition is more liberal—it predicts the availability of NPIs in more environments—than (3), since Strawson Downward-entailingness is weaker than Downward-entailingness. The reader can verify that (74c) Strawson-entails (74d) ((74c) $\overset{Strawson}{\Rightarrow}$ (74d)), leading to the grammaticality of the NPI *any* in (74a), as desired. Von Fintel 1999 is thus a *theory of possible licensers* and as such the condition it states is only a necessary one. Furthermore, it is only concerned with a specific category of NPIs, namely weak ones. Its two main tenets are:

1. NPIs are licensed by <u>operators</u> (as opposed to environments). This is what one might call the *syntactic* component of the theory. We have already shown that it is the monotonicity of the environment of NPIs that counts, rather than the properties of operators;

2. A necessary condition for being a suitable licenser is <u>Strawson Downward-entailingness</u>. This is the *semantic* component of the theory.

But as it stands, the theory is in fact too weak. In particular, it makes wrong predictions with regard to the singular definite article and *both*, two triggers which do not license weak NPIs in their restrictor (the conservative approach based on DEness makes the right predictions).

(77) *Context:* There is exactly one student who read some books on NPIs.

a. *The student who read any books on NPIs is selling them.

b. The student who read books on NPIs is selling them.

c. *Presupposition of (77b):* There is exactly one student who read books on NPIs.

(78) a. $[\![\text{novel}]\!] \Rightarrow [\![\text{book}]\!]$

b. The student who read a book is selling it.

Presupposition: There is exactly one student who read a book.

c. The student who read a novel is selling it.

Presupposition: There is exactly one student who read a novel.

d. (78b) $\not\Rightarrow$ (78c) *(not DE)*

e. (78b) $\overset{Strawson}{\Rightarrow}$ (78c) *(SDE)*

(79) *Context:* Exactly two students read some linguistics books.

a. *Both students who read any linguistics books have applied to the department.

b. Both students who read linguistics books have applied to the department.

c. *Presupposition of (79b):* There are exactly two students who read linguistics books.

(80) a. Both students who read books have applied to the department.

Presupposition: There are exactly two students who read books.

b. Both students who read novels have applied to the department.

Presupposition: There are exactly two students who read novels.

c. (80a) $\not\Rightarrow$ (80b) *(not DE)*

d. (80a) $\overset{Strawson}{\Rightarrow}$ (80b) *(SDE)*

In (77b) and (79b), a uniqueness presupposition is triggered. As a result, for each inference ((78) and (80)), the individual (or pair of individuals) denoted by the subject

DP is the same in the premise and in the consequence: for example, in any given situation the student who read a book and the student who read a novel, provided they exist and are both unique, have to be the same individual; but then whatever is predicated of one can also be predicated of the other, thus ensuring entailment in both directions, i.e. from sets to subsets and from subsets to sets.

Since singular *the* and *both* are not NPI licensers, this property of supporting downward as well as upward entailments has been the designated culprit of non licensing, e.g. in Guerzoni and Sharvit 2007 (this idea was first put forward in Lahiri 1998). Alongside Strawson Downward-entailingness, the notion of Strawson Upward-entailingness is called for:

(81) **Strawson Upward-entailingness:** A function f of type $<\sigma,t>$ is Strawson Upward-entailing (SUE) iff for all x, y of type σ such that $x \Rightarrow y$ <u>and $f(y)$ is defined</u>: $f(x) \Rightarrow f(y)$.

Let's verify that singular *the* and *both* are SDE, SUE in their restrictor.

(82) $[\![$ novel $]\!] \Rightarrow [\![$ book $]\!]$

a. The student who read books is selling them.

Presupposition: There is exactly one student who read books.

b. The student who read novels is selling them.

Presupposition: There is exactly one student who read novels.

c. (82a) $\not\Rightarrow$ (82b) *(not DE)*

d. (82a) $\overset{Strawson}{\Rightarrow}$ (82b) *(SDE)*

e. (82b) $\overset{Strawson}{\Rightarrow}$ (82a) *(SUE)*

So possible licensers cannot include SUE operators:[16]

(83) **Von Fintel/Lahiri's (vFL) Licensing Condition:** An NPI is only grammatical if it is in the scope of an α such that $[\![\alpha]\!]$ is SDE, <u>non SUE.</u>

This new condition correctly predicts that weak NPIs are grammatical in the scope of *only* and emotive factives:

(84) a. John is sorry that Mary bought any car.

b. $[\![$ Honda $]\!] \Rightarrow [\![$ car $]\!]$

c. John is sorry that Mary bought a car.

Assertion: John would prefer that Mary didn't buy a car.

Presupposition: John believes that Mary bought a car.[17]

d. John is sorry that Mary bought a Honda.

Assertion: John would prefer that Mary didn't buy a Honda.

Presupposition: John believes that Mary bought a Honda.

e. (84c) $\not\Rightarrow$ (84d) *(not DE)*

f. (84c) $\overset{Strawson}{\Rightarrow}$ (84d) *(SDE)*

g. (84d) $\overset{Strawson}{\not\Rightarrow}$ (84c) *(not SUE)*

(85) a. Only John has any friends in Chicago.

b. $[\![$ European friends $]\!] \Rightarrow [\![$ friends $]\!]$

c. Only John has friends in Chicago.

Assertion: No one who is not John has friends in Chicago.

Presupposition: John has friends in Chicago.

[16]SDE, non SUE operators are a superset of DE operators.

[17]This is a simplification (cf. (60)) which does not affect the reasoning.

d. Only John has European friends in Chicago.

Assertion: No one who is not John has European friends in Chicago.

Presupposition: John has European friends in Chicago.

e. (85c) $\not\Rightarrow$ (85d) *(not DE)*

f. (85c) $\overset{Strawson}{\Rightarrow}$ (85d) *(SDE)*

g. (85d) $\overset{Strawson}{\not\Rightarrow}$ (85c) *(not SUE)*

3.4.2 Genuine Counterexamples

I am now going to show that none of the data that we examined in section 3.3 are predicted by the vFL account, even if we amend it so that it takes the monotonicity of *environments* into account.

(86) **Von Fintel/Lahiri's (vFL) Environment-based Licensing Condition:** An NPI α is licensed in a sentence S only if there is an eligible constituent β of S containing α such that β is SDE, non SUE w.r.t. the position of α.

Let us first consider cases of disruption with weak NPIs. I restrict myself to cognitive factives and *aussi* (the verification of the other cases of disruption is straightforward).

(87) *Jean ne sait pas que Marie a lu quoi que ce soit. (13a)

a. Jean doesn't know that Marie read a book.

Assertion: Jean doesn't have the belief that Marie read a book.

Presupposition: Marie read a book.

b. Jean doesn't know that Marie read a novel.

Assertion: Jean doesn't have the belief that Marie read a novel.

Presupposition: Marie read a novel.

c. (87a) $\not\Rightarrow$ (87b) *(not DE)*

d. (87a) $\overset{Strawson}{\Rightarrow}$ (87b) *(SDE)*

e. (87b) $\overset{Strawson}{\not\Rightarrow}$ (87a) *(not SUE)*

Jean might very well think that Marie read some book, although not a novel, therefore the context of the NPI is not SUE; since it is SDE, the availability of the NPI is expected from the vFL perspective.

(88) *Je ne pense pas que [Jean]$_F$ ait lu quoi que ce soit lui aussi. (22)

a. I don't think that [Jean]$_F$ read a book too.

Assertion: I don't think that Jean read a book.

Presupposition: Somebody other than Jean read a book.

b. I don't think that [Jean]$_F$ read a novel too.

Assertion: I don't think that Jean read a novel.

Presupposition: Somebody other than Jean read a novel.

c. (88a) $\not\Rightarrow$ (88b) *(not DE)*

d. (88a) $\overset{Strawson}{\Rightarrow}$ (88b) *(SDE)*

e. (88b) $\overset{Strawson}{\not\Rightarrow}$ (88a) *(not SUE)*

Likewise, the context is SDE, non SUE (because I might think that Jean read a book, although not a novel); but contrary to vFL's prediction, a weak NPI is anti-licensed.

The number of wrong predictions of the vFL account increases drastically when we turn to strict NPIs. Let us first adapt the vFL proposal by defining Strawson Anti-additivity.

(89) **Strawson Anti-additivity:** A function f is Strawson Anti-additive (SAA) iff $f(\mathrm{A} \vee \mathrm{B}) \overset{Strawson}{\Longleftrightarrow} f(\mathrm{A}) \wedge f(\mathrm{B})$.

We can assume that the licensing condition for strict NPIs is that these items are only licensed in an SAA, non SUE environment (strict NPIs are not dealt with in von Fintel's original theory). Armed with the notion of Strawson Anti-additivity, we can now verify that in (51c) and (53b), the NPIs are placed in SAA environments. I show this for NPIs in the scope of *only* (the verification with other presupposition triggers is unproblematic):

(90) a. Only John drinks or smokes.
Presupposition: John drinks or smokes.

b. Only John drinks and only John smokes.
Presupposition: John drinks and smokes.

c. Only John drinks or smokes $\overset{Strawson}{\Longleftrightarrow}$ Only John drinks and only John smokes.

Still, strict NPIs fail to be licensed in this environment (51b)-(51c). Therefore what they look for is obviously not Strawson Anti-additivity but rather (in agreement with Gajewski 2005) Anti-additivity *tout court.* It is the presence of the presuppositions in (51b)-(51c) which ruins the Anti-additivity of the context. Strawson Anti-additivity doesn't suffice to license strict NPIs; Strawson-entailment is thus of no use for strict NPIs because presuppositions disrupt their licensing (except for the presupposition of superlatives: these create an SAA, non SUE, environment, so vFL makes the right prediction about them[18]). This is a point that proponents of Strawson-entailment grant (cf. Gajewski 2005).

[18]Provided that exhaustivity is turned into a presupposition along the lines of the proposal in section 3.4.3.2, vFL correctly predicts the unavailability of strict NPIs in the cleft-clause of *it*-clefts (since the environment is SUE). However this welcome result is counterbalanced by the wrong prediction about weak NPIs for which the theory was precisely and specifically tailored.

The main goal of this article is to show that neither the *Ignore presuppositions!* rule nor the *Neutralize presuppositions!* rule has a linguistic reality, because there are exceptions to the claim that presuppositions don't disrupt NPI licensing (the generalization (8) on p. 116 is false). These exceptions presented in section 3.3 undermine both strategies: it is not true that there is a mechanism which systematically weeds out presuppositions for the purposes of NPI licensing. This is not to say that the two strategies fare equally bad. In fact, the second strategy is worse than the first: it is faced with a fatal dilemma, and as a result Strawson-entailingness should be discarded altogether, as having no linguistic grounds (see section 3.4.3).

I make two claims. First, the meaning that is relevant for licensing is global, i.e. it includes presuppositions; it is the standard notion of downward-entailment (2) that applies. The second claim is that whenever presuppositions that ruin monotonicity are innocuous to NPI licensing, they are simply not incorporated into the global meaning. The crucial piece of evidence is provided by *it*-clefts.

3.4.3 *It*-clefts: A Dilemma (Against Strawson UEness)

In this section, I show that the inclusion of Strawson-entailment in the licensing condition of NPIs is fatally flawed. (i.) On its own, it leads to overgeneration: it wrongly predicts that NPIs are licensed by singular definite articles (cf. the previous section) and by *it*-clefts; (ii.) the recourse to SUEness doesn't fix the problem, it actually makes it worse. This is the novel point that the section makes. The discussion focuses on the exhaustivity effect found in *it*-clefts.

3.4.3.1 The Recourse to Strawson Upward-entailingness

NPIs are not allowed in the cleft-clause of *it*-clefts (in positive, unembedded sentences).

(91) *Context:* All the Chinese statuettes have been stolen.

*It is Fred who stole anything.

This is problematic for von Fintel's original analysis if *it*-clefts carry a presupposition of existence and of uniqueness (as is commonly assumed): if the assertion and the presupposition of *it*-clefts are as stated below (I simplify matters by using an individual variable, but quantifiers can of course appear in the focus of an *it*-cleft), the context created is SDE.

(92) a. It is α that *P*.

b. *Assertion:* $P(\alpha)$.

c. *Presupposition:* $\exists y[P(y) \wedge \forall z[P(z) \Rightarrow z=y]]$ *(this will be revised).*

However, the context is also SUE (Cable 2002), as shown in the downward inference below: since there is a single individual who stole a statuette and a single individual who stole a blue statuette in the context, the two have to be identical (the recourse to SUEness is the same solution that blocks NPI licensing by singular definite articles, (81) on p. 157).

(93) a. It is Igor who stole a statuette.

Assertion: Igor stole a statuette.

Presupposition: There is a unique person who stole a statuette.

b. It is Igor who stole a blue statuette.

Assertion: Igor stole a blue statuette.

Presupposition: There is a unique person who stole a blue statuette.

c. (93a) $\not\Rightarrow$ (93b) *(not DE)*

d. (93a) $\overset{Strawson}{\Rightarrow}$ (93b) *(SDE)*

e. (93b) $\overset{Strawson}{\Rightarrow}$ (93a) *(SUE)*

Therefore the vFL account (the original account supplemented with a ban against SUE contexts) makes the correct prediction about (91). However, this division of labor between assertion and presupposition is far from being universally accepted. Not that the existence presupposition is dubious, but the presuppositional nature of the exhaustivity effect is taken with a grain of salt. First, the existence presupposition: Percus (1997) and Rooth (1999) a.o. provide strong evidence in its favor, of which I present two pieces. A negative quantifier cannot appear in the cleft constituent:

(94) a. —A: Who saw John?

b. —B: #It's nobody who saw John. [Percus 1997, p. 339]

Rooth (1999) offers a second test: if we schematize an *it*-cleft as *it is* α *that P*, when the speaker asserts that only the individual α can potentially be in the extension of the predicate P, she cannot use a negated cleft (whereby she negates that α has property P), on pain of a clash with the existence presupposition carried by the sentence, as shown in (95b):

(95) *Context:* In my department, a football pool is held every week, where people bet on the outcomes of games. It is set up so that at most one person can win; if nobody wins, the prize money is carried over to the next week.

a. —A: Did anyone win the football pool this week?

b. —B: #Probably not, because it's unlikely that it is Mary who won it, and she's the only person who ever wins. [Rooth 1999, p. 7]

The uniqueness presupposition on the other hand is problematic. First of all, *it*-clefts are not always singular: the phrase in the cleft constituent can denote a plural individ-

ual, witness the felicity of (96):

(96) *Context:* Somebody ate the pizza.
It was Kenneth and Fiona who ate the pizza.

It-clefts need not be used in contexts where the predicate in the cleft-clause (predicate P) only has singular individuals in its denotation. Therefore the notion of uniqueness is inadequate here. But it won't do to replace it with the requirement that there exist a *maximal* (potentially plural) individual that is in the denotation of the predicate P. For this constraint is trivially satisfied as soon as some individual verifies P: if something or someone is P, then there exists a maximal individual that is P. In other words, a maximality presupposition on potentially plural individuals amounts to nothing but an existence presupposition. Still, an exhaustivity effect exists undeniably in *it*-clefts: it can be evidenced by asserting in a continuation that some other individual than the one denoted by the cleft constituent verifies P (97), or by using one of the tests of exhaustive identification devised by Szabolcsi (1981) (98):

(97) #It was Kenneth who ate the pizza, and Fiona ate it too.

(98) a. Mary picked a hat and a coat for herself.
$\Rightarrow$ Mary picked a hat for herself.
b. It was a hat and a coat that Mary picked for herself.
$\not\Rightarrow$ It was a hat that Mary picked for herself. [É. Kiss 1998, p. 250]

As it is hard to determine where the exhaustivity effect comes from, we are faced with an alternative: either it is due to a presupposition, or it is not. This is an important question, because exhaustivity is considered to be a presupposition by proponents of the vFL account (and they explain the unavailability of NPIs in *it*-clefts as an effect

of the SUEness that follows from exhaustivity). I now set out to show that whether exhaustivity is presuppositional or not, SUEness is useless and doesn't save vFL from incorrect predictions.

3.4.3.2 Exhaustivity: Presuppositional or Not?

Let us examine the two options in turn, and evaluate how Strawson-based accounts fare in each of them. I will first explore the hypothesis that the exhaustivity effect is not presuppositional (first option): this leaves open several possibilities (the exhaustivity claim is part of the assertion, or it is an implicature of some sort) which we need not go into. What matters is that under this hypothesis *it*-clefts only carry an existence presupposition. Interestingly, exhaustivity can be stated explicitly, without any infelicity (99a) (there is no harm in doing this); and NPIs are still disallowed under this modification (99b):

(99) *Context:* Statuettes were stolen from the museum.

a. It was Igor and no one else who stole something.

b. *It was Igor and no one else who stole anything.

Having exhaustivity as a presupposition secures SUEness, which is, according to vFL, fatal to NPIs. What I am proposing is that we make exhaustivity part of the assertion in order to create an SDE, non SUE environment: this shows that what anti-licenses NPIs is therefore not SUEness. One might object to this scheme that incorporating exhaustivity into the assertion by adding a conjunct in the syntax doesn't affect the overall structure of the *it*-cleft, and that as a result NPI licensing should not vary. But this criticism is only valid if NPI licensing is operator-based (and if an *it*-cleft is indeed an operator of sorts); however we know that there is good evidence that licensing is

environment-based.

Following the usual procedure, we set up a downward inference to verify the monotonicity of the context of the NPI in (99b). The only meaning components that are relevant to this computation are the assertion and the presupposition(s) of the sentences in the inference; since we are interested in the effects of exhaustivity on the licensing of NPIs, and we are supposing that exhaustivity is not part of the presupposition, we secure its presence by incorporating it into the assertive content:

(100) *It was Igor and no one else who stole anything.

a. $[\![$ blue statuette $]\!] \Rightarrow [\![$ statuette $]\!]$

b. It was Igor and no one else who stole a statuette.

Assertion: Igor and no one else stole a statuette.

Presupposition: Somebody stole a statuette.

c. It was Igor and no one else who stole a blue statuette.

Assertion: Igor and no one else stole a blue statuette.

Presupposition: Somebody stole a blue statuette.

d. (100b) $\not\Rightarrow$ (100c) *(not DE)*

e. (100b) $\overset{Strawson}{\Rightarrow}$ (100c) *(SDE)*

f. (100c) $\overset{Strawson}{\not\Rightarrow}$ (100b) *(not SUE)*

We are led back to the situation that SUEness was expressly designed to circumvent. The context is SDE and the NPI is wrongly predicted to be available: since exhaustivity is, by hypothesis, not presuppositional, the context cannot be SUE (it is not true that all situations in which Igor and no one else stole a blue statuette are situations in which Igor and no one else stole a statuette, for Eric might have stolen a red statuette). Therefore SUEness is of no avail here.

I am now going to show that the second option (exhaustivity is presuppositional) is also unavailable to vFL: the only plausible presuppositions are going to make the environment of the NPI in an *it*-cleft SUE, even in negated *it*-clefts, where NPIs are actually licensed.

Let us take a closer look at the kind of exhaustivity presupposition a sentence like (101) can have:

(101) It was Igor who stole a statuette.

Suppose the presupposition is categorical (as opposed to conditional): Igor and no one else stole a statuette. This is clearly not the inference that projects out of negation and other presupposition 'holes' in the sense of Karttunen 1973:

(102) a. It wasn't Igor who stole a statuette.
b. Was it Igor who stole a statuette?
c. If it was Igor who stole a statuette...
$\not\rightsquigarrow$ Igor and no one else stole a statuette.

If there is an exhaustivity presupposition, it should thus be conditional. As a first stab, we can try: if someone stole a statuette, Igor and no one else did (this is the presupposition assumed in Percus 1997). Alas, this makes the incorrect prediction that (103), when defined, entails that no one stole a statuette:

(103) It wasn't Igor who stole a statuette.

The only plausible conditional presupposition for (101) would be: if Igor stole a statuette, no one else did. This is the line of thought developed in Büring 2010, which I

will follow. This way we get, for a positive unembedded cleft, and without making any categorical claims about the (plural) individual denoted by the cleft constituent, that they exhaust the denotation of the predicate in the cleft-clause. Here's a formalization, inspired by Büring 2010:

(104) a. It is P that Q.

b. *Assertion:* $P \cap Q \neq \emptyset$

c. *Presupposition (of existence and exhaustivity):* $Q \neq \emptyset \wedge [P \cap Q \neq \emptyset] \rightarrow max(Q) \in P$

d. For any set R, *max*(R) = x such that $x \in R$ and $\forall y \in R\ y \leq x$ (where $\leq$ is the transitive, reflexive and antisymmetric part-of relation).

In *'It was Igor and Stella who stole a statuette'*, we treat *Igor and Stella* as a predicate of plural individuals (only true of the plural individuals identical with the mereological sum of Igor and Stella). And we say that the sentence presupposes that the maximal plural individual in the extension of the predicate *steal a statuette* has the property of being identical with the mereological sum of Igor and Stella. This way, we derive the exhaustivity effect (in addition to the existence presupposition). Applied to (105a), we get the correct result:

(105) a. It was Igor and Stella who stole a statuette.

b. Q: $*\lambda x.$ steal_statuette(x)

c. P: $*\lambda x.$ x = Igor $\oplus$ Stella

Assertion: Igor and Stella stole a statuette ($P \cap Q \neq \emptyset$)

Presupposition: Someone stole a statuette and if the sum of Igor and Stella stole a statuette, then the maximal individual who stole a statuette is identical with the sum of Igor and Stella ($\exists x\ Q(x) \wedge [P \cap Q \neq \emptyset\ ] \rightarrow$

max(Q) = Igor $\oplus$ Stella)

Now a new challenge awaits Strawson-based accounts: (weak) NPIs are licensed in the cleft-clause of clefts placed in the scope of a DE expression:[19]

(106) *Context:* Statuettes were stolen from the museum.

a. I doubt that it was Igor who stole anything, I think it was Peter.

b. It wasn't Igor who stole anything, it was Peter.

(107) a. $[\![$ blue statuette $]\!] \Rightarrow [\![$ statuette $]\!]$

b. It's not the case that it was Igor who stole a statuette.

Assertion: It's not the case that Igor stole a statuette.

Presupposition: Somebody stole a statuette and if Igor stole a statuette, no one else did.

c. It's not the case that it was Igor who stole a blue statuette.

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[19]The English speakers I surveyed do not share the judgment of ungrammaticality reported in Percus 1997, reproduced below as (i):

(i) *It wasn't John who did anything to help. [Percus 1997, ex. 28a]

I should also say that NPIs in negated clefts and in clefts placed in antecedents of conditionals are well attested on the internet. Here is one of the 15 hits (excluding duplicates and irrelevant results) for the Yahoo search on the exact string 'it wasn't him who * anything' (the relative rareness of the results is not due to anti-licensing, as results for 'it wasn't him who * something' are rarer still):

(ii) Pete swore it wasn't him who said anything and I should have believed him, because now he's probably pissed off at me. I still don't know who said it. Probably Tony, or maybe Chantal, Pete's sister. `http://pulmonary-hypertension-diaries.www.phcentral.org/diaries/full_diaries_u143/asc/16/`

Similarly with negated *think:*

(iii) I don't think it was actually Lisa that said anything about Miley. I know Rian's girlfriend did. `http://www.oceanup.com/2009/10/19/all-time-low-talk-justin-bieber-and-miley-`

Assertion: It's not the case that Igor stole a blue statuette.

Presupposition: Somebody stole a blue statuette and if Igor stole a blue statuette, no one else did.

d. (107b) $\not\Rightarrow$ (107c) *(not DE)*

e. (107b) $\overset{Strawson}{\Rightarrow}$ (107c) *(SDE)*

f. (107c) $\overset{Strawson}{\Rightarrow}$ (107b) *(SUE)*

The SDEness of the context is fairly easy to see. But its SUEness is less straightforward, so a walk-through is in order. To ascertain whether (107c) Strawson-entails (107b), we restrict our attention to situations where the former is true (hence defined) (i.e. situations where Igor didn't steal a blue statuette but someone did), and where the presupposition of the latter is satisfied. Can (107b) fail to be true? Suppose it is false, i.e. suppose that Igor stole a statuette. Given that the presupposition is satisfied by hypothesis, someone stole a statuette but no one else but Igor did. This contradicts the assumption that someone who is not Igor stole a blue statuette. Therefore whenever (107c) is true, (107b) is true too. This means that the context is SUE, and inasmuch as it is also SDE, vFL wrongly predicts that an NPI should be ungrammatical in it.

To sum up, *it*-clefts pose a dilemma to vFL: either exhaustivity is not presuppositional and the account overgenerates (it wrongly predicts the grammaticality of NPIs in the cleft-clause of positive, unembedded *it*-clefts), or exhaustivity is presuppositional and the account undergenerates (it wrongly predicts the ungrammaticality of NPIs in the cleft-clause of *it*-clefts in the scope of a DE function). I believe that this problem is serious enough to cast doubt on the desirability of the use of Strawson-entailment.

Interestingly, the facts we have just discussed are going to reveal that innocuous presuppositions (e.g. of *it*-clefts in the case of weak NPIs) are simply not factored into the meaning that is relevant for the licensing of NPIs. Let us show this in detail.

3.4.3.3 The Presupposition of the Cleft is Not Factored In

Suppose that the presuppositions of *it*-clefts must be taken into account in the computation of the licensing of NPIs in the cleft-clause (just as the presupposition of *aussi*) and suppose that we use the standard notion of entailment (1) instead of Strawson-entailment; let us only consider the uncontroversial presupposition, the existence one (we can leave aside the exhaustivity effect: it cannot make DE a context whose DEness is ruined by the existence presupposition). The motononicity of the environment is broken in the cleft-clause of all clefts, be they embedded under a DE function or not; NPIs are wrongly predicted to be always unavailable in *it*-clefts (cf. the two downward inferences below): this is undesirable, because weak NPIs are in fact licensed in negated clefts.

(108) *It was Igor who stole anything.

a. It was Igor who stole a statuette.
   Assertion: Igor stole a statuette.
   Presupposition: Someone stole a statuette.

b. It was Igor who stole a blue statuette.
   Assertion: Igor stole a blue statuette.
   Presupposition: Someone stole a blue statuette.

c. (108a) $\not\Rightarrow$ (108b) *(not DE)*

(109) I doubt that it was Igor who stole anything.

a. I doubt that it was Igor who stole a statuette.
   Assertion: I doubt that Igor stole a statuette.
   Presupposition: Someone stole a statuette.

b. I doubt that it was Igor who stole a blue statuette.

Assertion: I doubt that Igor stole a blue statuette.

Presupposition: Someone stole a blue statuette.

c. (109a) $\not\Rightarrow$ (109b) *(not DE)*

We must conclude that the presuppositions of *it*-clefts are *not* taken into account for NPI licensing. To reiterate, they are not neutralized *à la* von Fintel (in view of the dilemma analyzed above). Instead, they are not incorporated into the meaning: the computation of NPI licensing only has access in this case to the strict assertive content. Consider again the downward inferences above but consider only the assertive content: in (108), the assertion of the a. sentence doesn't entail the assertion of the b. sentence; in (109), it does. Only in (109) is the context of the NPI DE. The NPI pattern is thus straightforwardly derived if the assertion alone is taken into consideration.

At this point, we come across an interesting theoretical problem: if we are right in assuming that presuppositions sometimes do not enter the calculation of licensing, why should this be so? We could imagine that the incorporation doesn't take place because in the presence of an NPI, the presupposition is not triggered (for some unknown reason). But this is bound to be incorrect, as it is clear that the presupposition projects, even in the presence of an NPI. We used Rooth's test to show that *it*-clefts carry an existence presupposition; we can apply the test again, but this time to a cleft that contains an NPI in its cleft-clause:

(110) *Context:* Same context as in (95).

a. —A: Did anyone win the football pool this week?

b. —B: #Probably not, because it's unlikely that it is Mary who won anything, and she's the only person who ever wins.

c. —B': Probably not, because it's unlikely that $[\text{Mary}]_F$ won anything, and she's the only person who ever wins.

Assuming that the existence presupposition carried by the cleft in (110b) clashes with the assertion that no one won (this is the result of denying that Mary won and of claiming that only she ever wins), the oddness of (110b) can be taken as evidence that in that sentence too an existence presupposition is triggered, despite the presence of an NPI in the cleft-clause.

This leaves only one option open. The presupposition of *it*-clefts is triggered even when NPIs are licensed, but the system that computes the licensing is blind to it, and only operates on the literal meaning. Of course, I hasten to say that this blindness cannot be general, given the disruption caused by the presupposition of French cognitive factives, *aussi/too* (3.3) and the definite article (3.8.1). Depending on the trigger, or rather depending on the presupposition, the system does or does not have access to presuppositions when it checks NPI licensing.

This may sound like a non sequitur: in all cases that we have looked at so far, presuppositions are in fact present in a certain way, since they are part of the meaning (*sensu lato*) of sentences. In other words, they *project*. But the fact that they are present ultimately says nothing about their presence when licensing is computed. I propose that presuppositions are a detachable part of meaning (in agreement with Ladusaw 1979), and provide evidence for the hypothesis that the system that computes them is modular (in section 3.5), and for this reason presuppositions do not necessarily interfere with NPI licensing.

Summary

In all instances where a presupposition is innocuous to an NPI α, the vFL account is in a tie with the hypothesis that the presupposition is not incorporated in the monotonicity computation relative to α. We have found one decisive case, namely *it*-clefts, where the neutralization of a presupposition (i.e. the vFL strategy) has unwelcome conse-

quences while the rival hypothesis (non incorporation) derives the facts adequately. Given that there exists at least one instance of innocuousness of a presupposition that can be explained by its absence from the meaning relevant for NPIs (although it is triggered and gets projected), and given that all other instances are amenable to the same explanation, it is safe to conclude, by application of Occam's razor, that the postulation of Strawson-entailment is unwarranted, and should be discarded as having no linguistic reality.

The next section shows that the pattern of NPI disruption provides an interesting view on the status of presuppositions in the computation of meaning.

3.5 A New Picture

3.5.1 Interesting Consequences

3.5.1.1 Local Accommodation and Non-projection

The present article offers the first touchstone that can differentiate local accommodation and non-projection on the one hand, and non-triggering on the other. Presuppositions are sometimes 'cancelled' through local accommodation (Heim 1983), i.e. fail to project because they are made part of the assertive content in the scope of negation.

(111) #The King of France is bald.
$\rightsquigarrow$ There exists a King of France.

(112) a. The King of France is not bald, because there is no King of France.
b. $\not\rightsquigarrow$ There exists a King of France.
c. Accommodation in (112a): It is not the case that (there is a King of France and that he is bald), because there is no King of France.

The disruption effect remains even when the presupposition is locally accommodated. To show this, I use a French cognitive factive (because the presupposition of *aussi* is notoriously hard to accommodate), as in (113):

(113) **Pierre ne s' aperçoit pas que Marie a quelque chance que ce*
Pierre NEG REFL perceives NEG that Marie has some chance that this
soit de gagner, car elle n' a aucune chance. (French)
be.SUBJ of win for she NEG has no chance

Intended: *'Pierre doesn't realize that Marie has any chance to win, for she has no chance.'*

Similarly, the effect remains if the presupposition is satisfied, as in (115) (the presupposition of the consequent is satisfied by the antecedent):

(114) If Moldavia is a monarchy, then the King of Moldavia is powerful.

$\not\rightsquigarrow$ There exists a King of Moldavia.

(115) **Je ne pense pas que si Marie a invité Pierre, [Jean]$_F$ ait*
I NEG think NEG that if Marie has invited Pierre Jean have.SUBJ
invité qui que ce soit lui aussi.
invited who that this be.SUBJ him too
Intended: *'I doubt that if Marie invited Pierre, [Jean]$_F$ also invited anyone.'*

Once triggered, presuppositions cause a disruption, as if the system responsible for NPI licensing processed them blindly.[20] Interestingly, not all presupposition triggers cause a disruption (far from it, cf. 3.3). But the typology that we observe doesn't match previously proposed typologies of presuppositions. Now that we have explored

[20]Strikingly, the disruption effects of scalar implicatures studied by Chierchia (2004) (cf. 3.3.6 and 3.6) also persist when the inference (a scalar implicature) is defeated:

(i) *The students have no background whatsoever, so I doubt that every student has any background.

the realm of presupposition triggers, we can discard a potential explanation for the disruption effect: some (Abusch (2002) and Abbott (2005)) have proposed that some presupposition triggers are 'soft' (*know*) and others are 'hard' (*again*), according to whether their presuppositions are easily accommodated or not.

(116) a. John doesn't know that it's raining because it's not raining!

b. #I don't know if Jane ever rented *Manhattan* before, but perhaps she's renting it again. [Simons 2001, ex. 6]

There is some appeal to this theory: if a presupposition is easily neutralized, Abusch argues, this is because it is not semantically encoded. We could use this distinction to account for our disruption effects. Alas, the cartography of hard and soft triggers doesn't fit the data that we have gathered and presented. For example, *know* should count as *soft* (but it is disruptive in French), but *again* and aspectual verbs like *stop* and *start* will count as *hard* (but they don't disrupt weak NPIs).

3.5.1.2 Non-triggering

The cases we inspected in 3.5.1.1 required added material which cancelled the presupposition by tinkering with the context set. The cases we are turning to are of a different kind: certain presupposition triggers can be placed in a syntactic configuration in which they never yield a presupposition (e.g. a verbal trigger ceases to be presuppositional when it embeds a subjunctive clause). The disruption effect does not obtain when the presupposition is simply not triggered. This can be illustrated with the French cognitive factive predicate *s'apercevoir* 'realize', which doesn't yield a presupposition when it is placed in the antecedent of a subjunctive conditional and selects a subjunctive complement. (113) and (117a) form an interesting pair which offers a di-

rect illustration of the difference between local accommodation and non-triggering:[21]

(117) a. *Si Pierre s' apercevait que Marie ait changé quoi que*
if Pierre REFL perceived that Marie have.SUBJ changed what that
ce soit, il serait en colère.
this be.SUBJ he would-be in wrath
'If Pierre found out that Marie changed anything, he would be mad.'

b. *Presupposition:* None.

Similarly, the verb *se souvenir* 'remember' doesn't trigger a presupposition when it selects the subjunctive (this requires that it be negated). (17a) is repeated for convenience:

(118) a. *Jean ne se souvient pas que Marie lui ait dit*
Jean NEG REFL remembers NEG that Marie to-him have.SUBJ said
quoi que ce soit.
what that this be.SUBJ
'Jean doesn't remember that Marie told him anything.'

b. *Presupposition:* None.

This comparison suggests that local accommodation, which is held by some as problematic and dubious (van Rooy 1999, von Fintel 2008), is not reducible to non-triggering. The examination of NPIs therefore provides some insights into the mechanisms of presupposition 'cancellation'.

[21] A similar phenomenon occurs with implicatures. A numeral like 11 is not always high on its scale, and it can actually be the weakest element of a truncated scale (e.g. in a context where one groups numerals by multiples of 11): then no indirect scalar implicature is triggered, hence the grammaticality of (ia):

(i) a. (A soccer coach can say…) I never had eleven kids who won any championship.
b. *I didn't meet eleven people who read any of my poetry. [Chierchia 2004]

3.5.2 A Hypothesis about the Detachability of Presuppositions

The lessons that we can draw from our exploration are the following (I refer the reader to Tables 3.1 and 3.2 on p. 147 for a panoptic view of the data):

1. Very superficially: some presuppositions disrupt the licensing of some weak NPIs in some languages. And some presuppositions disrupt the licensing of some strict NPIs in some languages.

2. Furthermore, it seems that in a given language, strict NPIs are vulnerable to a proper superset of the presuppositions that weak NPIs are vulnerable to. I propose the following generalization:

(119) **Generalization:** In a given language L, if the licensing of a weak NPI π_{w}^{-} is disrupted by a presupposition ρ, then the licensing of a strict NPI π_{s}^{-} is disrupted by ρ too.

3. Lastly, the presuppositions that weak French NPIs are vulnerable to form a proper superset of the presuppositions that English weak NPIs are vulnerable to.

We have thus implicational hierarchies—as stated in (119)—within each language, and cross-linguistic comparison suggests that there might be some stable general hierarchy across languages (per 3. above). Given that we know that presuppositions are sometimes not factored in (this is the lesson learned from *it*-clefts in 3.4.3), I want to propose that Tables 3.1 and 3.2 reveal a modular organization and show us a map of the connections between the system that computes licensing and the various modules where presuppositions are computed. The clearest way to think about these relations, I think, is in terms of timing. It is hard to make sense of the observed patterns unless we accept these two stipulations: (i.) there is a cross-linguistically fixed order of incorporation of presuppositions; and (ii.) the licensing of weak NPIs is always checked

before the licensing of strict NPIs. We have thus two parallel sequences: licensing checking on the one hand and incorporation of presuppositions on the other. Variation comes from differences in timing within the two parallel sequences, not in their internal ordering. Figure 3.1 fleshes out this idea. It does justice to the observation that presuppositions that end up being part of the global meaning of a sentence (e.g. the presupposition of the *it*-cleft in (106)) fail to disrupt the licensing of a weak NPI π_{w}^{-} but disrupt that of a strict NPI π_{s}^{-}.

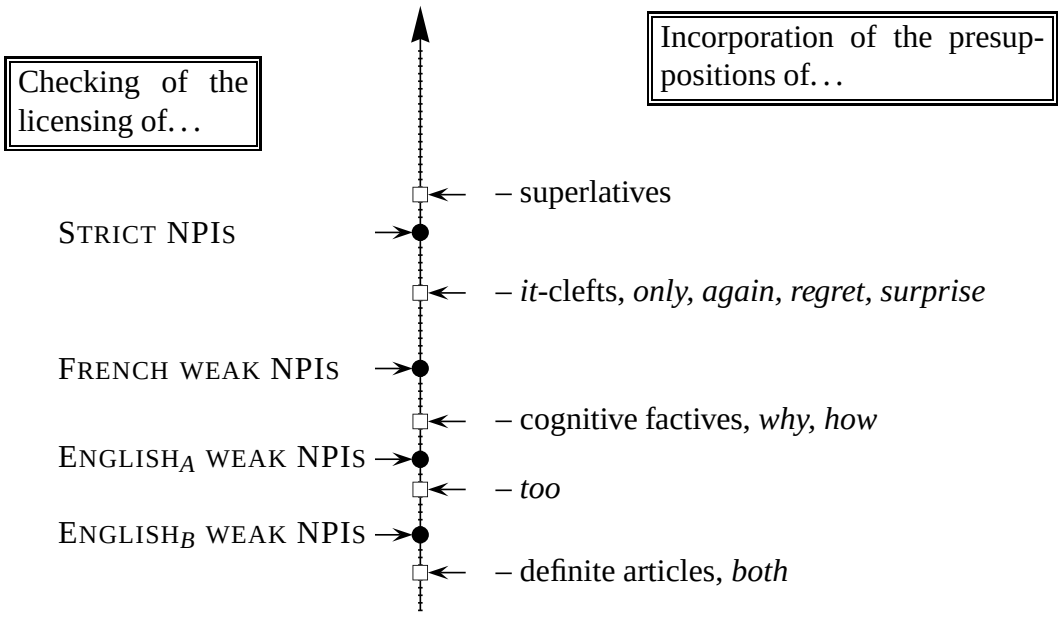

Figure 3.1: Timing of Presupposition Incorporation

Under this hypothesis, the incorporation of presuppositions can be seen in a *derivational* manner: one has to imagine that the presuppositions of a sentence S are detachable parts of the meaning of S—this is in essence Ladusaw's (1979) original claim—i.e. there exist certain representations of S that do not include them. Furthermore, presuppositions are not all incorporated at the same time during the course of the derivation: different representations of S include different presuppositions. The derivation process is cumulative: once a presupposition ρ has been incorporated into a repre-

sentation of *S*, later representations of *S* include ρ as well. The licensing of NPIs also occurs in stages (the licensing of weak NPIs precedes that of strict NPIs). Let us describe the derivational process for an ungrammatical sentence with two presupposition triggers and two NPIs of different strengths (the five steps are given below the sentence):

(120) *The student who has any books on NPIs is sorry to have left until the next day.

(i) The meaning of (120) reduces to its assertive content;

(ii) The meaning of (120) incorporates the presupposition of the definite article (this makes the position of *any* in its restrictor non DE);

(iii) The licensing of weak NPIs is checked. *Any* is anti-licensed;

(iv) The meaning of (120) incorporates the presupposition of *sorry* (this makes the position of *until* in its complement non DE, hence non AA);

(v) The licensing of strict NPIs is checked. *Until* is anti-licensed.

NPIs are thus a probe into the workings of presupposition, and can be used to support the hypothesis that presuppositions are a detachable part of meaning, *pace* von Fintel. Now, one cannot hold that presuppositions can be 'ignored' (as claimed by Ladusaw) because in view of the numerous cases of disruption, this would amount to saying that *certain* presuppositions can be ignored for *certain* NPIs and not others. Such a perspective is not only highly stipulative—for each presupposition, one has to make an ad hoc hypothesis about whether it can be ignored in the licensing of weak NPIs and a similar hypothesis, equally ad hoc, with regard to strict NPIs—and blind to the patterns revealed in our Tables, it also rests on the problematic assumption that there

exist exceptions to the licensing conditions ((9) on p. 118 and (44) on p. 138).

I think that we are not forced to adopt this implausible view. I propose instead that presuppositions are incorporated into the meaning of sentences in stages, and that *once they are incorporated*, they cannot fail to be part of the computation of monotonicity relevant to NPI licensing: for any presupposition ρ and NPI α in S such that the polarity of ρ is not negative w.r.t. the position of α, ρ doesn't disrupt the licensing of α only if ρ is not (yet) incorporated into the meaning of S when the licensing of α is checked. It is now necessary to explore other languages, to verify the hypothesis about the order of incorporation of presuppositions. Besides, if the hypothesis is confirmed, it should be possible to draw a much more fine-grained picture—hopefully an exhaustive ordering—once we determine, for a large enough sample of languages, which presuppositions disrupt the licensing of which NPIs. For example, it is possible that in some language L, weak NPIs are vulnerable to the presupposition of *regret* but are impervious to the presupposition of *surprise*, in which case we would be led to add a dot on the arrow in Figure 3.1 on p. 180.

We can conclude that neither *Ignore Presuppositions!* (Ladusaw) nor *Neutralize Presuppositions!* (von Fintel/Lahiri) is linguistically grounded: once incorporated, a presupposition is part of the meaning of the sentence in which it is triggered, and is a potential monotonicity-breaker.

3.6 Gajewski 2009: Doing Away with Anti-additivity?

The current debate about weak and strict NPIs is divided between two strategies: the point of departure of the first strategy, upheld by the followers of Zwarts 1998, is the idea that different NPIs are sensitive to different logical properties (namely DEness for weak NPIs and so-called Anti-additivity for strict NPIs), while the other strategy

recognizes only one such logical property, *viz* DEness, and locates the source of the variation in the vulnerability of items to the effects of scalar implicatures (weak scalar terms such as *at most N* give rise to SIs). The second option is pursued in Gajewski 2009. This proposal rests on the following two generalizations (we have already presented data that undermine each of the two claims, I will not repeat them here):

(121) a. The licensing of weak NPIs is not disrupted by any presuppositions.

b. The licensing of strict NPIs is disrupted by all presuppositions.[22]

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[22]To salvage the second generalization in the face of the availability of strict NPIs in superlatives, Gajewski (2005) proposes that the presupposition of superlatives is not triggered by the morpheme *-est* but by some higher operator. In *'Emma is the tallest girl in the class'* the superlative morpheme contributes the meaning that Emma is taller than any girl in the class (i), and the operator contributes the presupposition that Emma is a girl in the class.

(i) $[\![\text{-est}]\!] = \lambda R.\lambda P.\lambda x.\exists d[R(d)(x)=1 \wedge \neg\exists y[P(y) \wedge y \neq x \wedge R(d)(y)=1]]$

(ii) a. Emma is the tallest girl in the class.
b. [the Op [[-est tall(d)] [girl in the class]]]

As Gajewski notes, the predicate denoted by [[-est tall(d)] [girl in the class]] is true of entities x which have the property of being taller than any girl in the class ($\neq$ x): a boy or a SUV can be in the denotation of this predicate. It is hard to see how the presupposition triggered in (iia) that Emma is a girl in the class can be generated by a higher operator taking as input such a predicate. Gajewski suggests that the structure contains a silent copy of the NP *girl in the class:*

(iii) [the Op [$_{\text{AdjP}}$ [-est tall(d)] [girl in the class]] [$_{\text{NP}}$ ~~girl in the class~~]]

Alternatively, he proposes that superlative constructions have a semantics equivalent to that of exceptive constructions.

(iv) There is a degree d such that no girl in the class but Emma is d-tall.

He convincingly argues elsewhere (Gajewski 2008) that the difference between *only John* and *no one but John* (the former doesn't license strict NPIs while the latter does) can be explained if *no one but John* is discontinuous and the exceptive phrase is interpreted higher than the negative quantifier. Some silent exceptive should be postulated in superlatives for the analogy to work.

These two solutions are not outlandish, but they serve a purpose (namely show that all presuppositions disrupt the licensing of strict NPIs) that is only really appealing if the symmetric claim (no presuppositions disrupt the licensing of weak NPIs) is warranted. But it clearly isn't.

Gajewski 2009 holds that operators that license weak NPIs are SDE since presuppositions are assumed to be innocuous (this proposal is operator-based and as such ignores the contribution of triggers other than licensers); if one assumes that strict NPIs are sensitive to Anti-additivity, it appears that Strawson Anti-additivity is not sufficient to license them (cf. p. 161) and that presuppositions should not be neutralized by Strawson-entailment. Gajewski summarizes the empirical picture that he assumes to be correct in Table 3.3.

	Entailment	Strawson-entailment
DE	???	Weak NPIs
AA	Strict NPIs	???

Table 3.3: The Current Picture according to Gajewski 2009

A simplification seems desirable, he argues: he proposes that we can account for the facts with a single binary parameter (and dismiss the DE/AA parameter).

	Entailment	Strawson-entailment
DE	Strict NPIs	Weak NPIs

Table 3.4: Gajewski's 2009 Division of Labor

Under this view, strict NPIs require strictly DE operators while weak NPIs require SDE ones. The motivation for doing away with Anti-additivity is that the most notorious circumstance where weak NPIs are content while strict NPIs fail to be licensed (i.e. in the scope of *at most N*) is one where a scalar implicature is triggered (123):

(122) a. At most five students understood anything.

b. *At most five students have exercised in years.

(123) a. At most five students *X*-ed.

b. *Scalar Implicature:* Some student *X*-ed.

Recall that under the Anti-additivity hypothesis, the licensing failure in (122b) is imputed to the non Anti-additivity of the context created by the quantifier *at most N*; in Gajewski 2009, the meaning relevant for NPI licensing is strengthened to include SIs, and this inclusion has the disruptive effect first theorized in Chierchia 2004 (see also section 3.3.6 above and Homer 2010a).

Chierchia's original claim dealt mainly with the implicatures triggered when a strong scalar term (i.e. an item that sits at the strong end of a Horn scale) is sandwiched between a DE function and an NPI, and makes the NPI unacceptable (cases such as (122a), where a direct SI makes the environment of the NPI non-monotonic without affecting licensing, were actually a challenge to the proposal). In Chierchia's system, this subcategory of SI is called indirect.

Now back to the unequal fates of weak and strict NPIs under *at most N:* Gajewski's theory, which is operator-based, is that *at most N* fails to license strict NPIs because its *strong* meaning is non-monotonic (hence not a strictly DE function), and strict NPIs require strictly DE functions. It licenses weak NPIs because these must be in the scope of an expression whose *plain* (=non-strengthened) meaning is Strawson-DE. This gives us two licensing conditions:

(124) a. A weak NPI α is licensed only if it occurs in the scope of β, where $[\![\beta]\!]$ is SDE;

b. A strict NPI α is licensed only if it occurs in the scope of β, where the implicature-enriched meaning of β is DE.[23]

[23]Since the theory is operator-based, Gajewski needs to give a rule for the implicature-enriched meaning of generalized quantifiers:

There is an interesting twist here. Chierchia (2004) explains the disruption effects of SI triggers intervening between a licenser and a weak NPI but faces the challenge that the direct SI triggered by *at most N* is not a disruptor. This case is problematic if the strong meaning is to be taken into account for the licensing of weak NPIs, as one expects it to be in Chierchia's initial system: Chierchia is aware of this challenge and in his 2004 article[24] he argues that only indirect scalar implicatures interfere with licensing because their computation requires a specific form of functional application which is sensitive to the polarity of functions; direct scalar implicatures on the other hand are added *after* the plain meaning is computed, which leaves room for the checking of NPI licensing before the introduction of the SI. Gajewski takes the proposal upside down, so to speak: the SI triggered by quantifiers such *at most N* is not disruptive for weak NPIs as it is only taken into account in the licensing of strict NPIs. The very facts that Chierchia's theory were tailored to explain (intervention by SI triggers) can no longer be explained: the source of the disruption of the licensing of weak NPIs in e.g. (68b) cannot be scalar implicatures (unless one draws a distinction between direct and indirect scalar implicatures and claims that the meaning relevant for weak NPIs includes the latter but not the former; notice that this move would require turning Gajewski's 2009 into an environment-based theory). This, I think, is a problematic aspect of Gajewski's proposal.[25]

(i) $[\![\text{EXH Q}]\!]^{w}(\text{C}) = \lambda \text{P}_{<e,t>}.[\![\text{Q}]\!]^{w}(\text{P})=1 \wedge \forall \text{Q'} \in \text{C}[\text{Q'}(\text{w})(\text{P})=1 \rightarrow \forall \text{w'}[[\![\text{Q}]\!]^{w'}(\text{P})=1 \rightarrow \text{Q'}(\text{w'})(\text{P})=1]\,]$

[24]Chierchia 2006 provides a different explanation based on syntactic dependencies between exhaustivity operators on the one hand and scalar items and NPIs on the other. Like Chierchia 2004, this solution both maintains the relevance of the strong meaning for weak NPIs and deals with the seemingly exceptional behavior of direct SIs.

[25]Notice that Gajewski's licensing conditions differ from each other in two respects: strong meaning and strict DEness for strict NPIs, plain meaning and Strawson DEness for weak NPIs. This is rather surprising, since Gajewski proposes to do away with Anti-additivity for reasons of economy. Keeping all other assumptions constant, another step in the direction of a truly parsimonious theory would be, I suggest, to make the plain meaning relevant for weak NPIs be the assertive content (to the exclusion of presuppositions) *à la* Ladusaw: this way the strong meaning incorporates SIs and presuppositions,

Lastly, and maybe more importantly, there are some facts that the Anti-additive hypothesis seems to be better suited to explain than Gajewski's proposal. In the complement clause of certain verbs under a superordinate negation, e.g. *claim*, strict NPIs are anti-licensed (125a). Again, this is evidence in favor of an environment-based approach; but even granting this, there is no scalar implicature or presupposition that can interfere here, therefore the cause of the licensing failure must be sought in the 'negative strength' of the environment, which turns out to be DE but not AA (the direction from the wide scope conjunction to narrow scope disjunction is not valid):

(125) a. *John doesn't claim that Eve left until the next day.

b. John doesn't claim that Eve owns a car $\Rightarrow$ John doesn't claim that Eve owns a red car. *(DE)*

c. John doesn't claim that Eve laughed or cried $\Rightarrow$ John doesn't claim that Eve laughed and John doesn't claim that Eve cried.

d. John doesn't claim that Eve laughed and John doesn't claim that Eve cried $\not\Rightarrow$ John doesn't claim that Eve laughed or cried. *(not AA)*

In sum, Gajewski's proposal suffers from two shortcomings: it rests on incorrect generalizations about the interaction between NPIs and presuppositions, and it fails to account for certain facts that the Anti-additive hypothesis explains.

3.7 Conclusion

This article provides the first comprehensive description of the interaction between presuppositions and NPIs in French and English. It shows that, contrary to the con-

and the plain meaning the assertion alone. This modification achieves the same results as Gajewski's original claim (and shares all its shortcomings), and dispenses with Strawson entailingness to boot.

sensus on the subject, certain presuppositions disrupt the licensing of weak NPIs, and nearly all presuppositions disrupt the licensing of strict NPIs. Grammar doesn't allow either of the following strategies: *Ignore Presuppositions!* (which checks NPI licensing on the assertive content alone) and *Neutralize Presuppositions!* (which checks NPI licensing on a meaning that includes presuppositions but circumvents their effects on monotonicity). In view of the disruption effects that I bring to light, the only viable hypothesis is, I submit, that Downward-entailingness is the logical property that NPIs are sensitive to, but the meaning that is relevant for NPI licensing does not always encompasses all presuppositions. I propose that NPIs reveal the modular organization of the system that computes presuppositions on the one hand, and of the system that checks NPI licensing on the other.

3.8 Appendix

3.8.1 Appendix I: Definite Descriptions

In this section, I show that the unavailability of NPIs in the restrictor of definite descriptions is due to their presupposition. Using Strawson Upward-entailingness proves to be inadequate, therefore Strawson-entailment itself should not be used (we reach the same conclusion that we reached with regard to *it*-clefts).

The restrictors of definite descriptions and of *wh*-phrases are the two contexts, besides *it*-clefts, for which SUEness is invoked in the literature. Throughout, I only discuss definite descriptions (but the reasoning applies equally well to *wh*-phrases). I argue that NPIs are only allowed in these environments when the existence presupposition is trivialized (i.e. it is triggered but the individual that satisfies it is a null entity): therefore, I argue, grammar doesn't recognize the notion of SUEness. Throughout, I will assume the following meaning for definite descriptions (in doing so, I follow

Link's (1983) intuition that definite descriptions, both singular and plural, denote the maximal element of a set):

(126) a. $[\![$ the NP $]\!] = max([\![$ NP $]\!])$

b. For any set R, max(R) = x such that $x \in R$ and $\forall y \in R\ y \leq x$ (where $\leq$ is the transitive, reflexive and antisymmetric part-of relation).

c. *Presupposition:* $[\![$ the NP $]\!]$ presupposes that $[\![$ NP $]\!]$ includes a maximal member.

d. Denotation of singular NPs: the denotation of a singular NP includes only atomic individuals.

e. Denotation of plural NPs: the denotation of a plural NP includes all the individuals whose atomic parts belong to the denotation of the corresponding NP.

First of all, observe the contrast exemplified in (127): while the NPI in anti-licensed in the restrictor of singular *the*, it is licensed in the restrictor of plural *the*. This contrast has been taken (e.g. in Guerzoni and Sharvit 2007) as a motivation for the use of SUEness, as plural *the*, contrary to singular *the*, is non SUE in its restrictor (both are SDE).

(127) a. *The student who has any books on NPIs is selling them.

b. The students who have any books on NPIs are selling them.

[Guerzoni and Sharvit 2007, ex. 29 p. 12]

However the situation is more complex than it seems at first. The speakers I surveyed either rejected (127b) or mentioned that it was only acceptable if the existence of students who have books on NPIs was not guaranteed (I will say more about this

shortly). Furthermore, it is impossible to generalize that singular definite descriptions are always improper environments for NPIs while plural definite descriptions are always proper environments. Regarding the first conjunct of this possible generalization, consider the following pair:

(128) a. The student who has ever tried to grasp this theorem knows how hard it is.

b. The students who have ever tried to grasp this theorem know how hard it is. [Hoeksema 2008, p. 405]

Regarding the second conjunct, observe the following contrasts, from Homer 2008 (cf. also Hoeksema 2008[26]).

(129) a. The drugs that have any hazardous side effects must go into a secure place.

b. *Context:* My backpack fell into the fountain; I carried two kinds of drugs in it: the vitamins are intact but…

*The drugs that have any hazardous side effects are soaked.

(130) a. The students who have ever been to Paris are happy about their trip.

[26]Hoeksema (2008) claims that the only definite descriptions where NPIs are licit are the generic ones, which according to him do not trigger an existence presupposition; he uses this fact in an argument against Strawson-entailment. It seems to me that the generalization is incorrect, as NPIs can be found in plural definite descriptions that are not clearly generic (see my example of an episodic sentence (135)). Furthermore, proponents of Strawson-entailment can easily account for licensing in generic singular definite descriptions: those lack a uniqueness presupposition, therefore their restrictor is not SUE. And they could also accept the view that definite descriptions are only monotonic with the adjunction of background assumptions (cf. the discussion in the text below), and therefore predict the ungrammaticality of (i) for want of such assumptions:

(i) *John and Bill are the students who have ever tried to grasp this theorem. [Hoeksema 2008, ex. 31]

b. *Context:* The students are enjoying themselves at the party, except for a few of them, who happen to have a characteristic in common: they recently came back from Paris. No other student has ever been there...

*The students who have ever been to Paris are already leaving!

The latter facts are strongly reminiscent of the contrasts studied in Heim 1984 in relation to conditionals.

(131) a. If you read any newspaper at all, you are well informed.

b. *If you read any newspaper at all, you remain quite ignorant.

[Heim 1984, ex. 16]

After Lewis (1973), Heim claims that antecedents of conditionals don't conform to the behavior that the material implication analysis predicts: making the antecedent stronger is not always truth-preserving, as in the following example:

(132) a. If you put a pinch of salt in this soup, I will throw it out.

b. $\not\rightarrow$ If you put a pinch of salt and another pound of leeks and some more water in this soup, I will throw it out. [Heim 1984, ex. 10]

In light of such facts, Heim contends that antecedents of conditionals are not monotonic. But NPIs can still appear in them under certain conditions that the comparison of (131a) and (131b) helps delineate. Notice that only the consequents of the conditionals differ. Furthermore, there is an intuitive link between informedness and newspaper reading; no such natural link can be established between ignorance and newspaper reading. It is a commonplace assumption that the more newspapers you read, the more informed you are; this assumption is undoubtably more commonsensical than the rule that reading one or more newspapers doesn't change your state of ignorance. Heim

suggests that it is the presence of certain background assumptions that secures a restricted form of DEness in *if*-clauses. In effect, given the assumption that the more newspapers you read, the better informed you are, the sentence *'If you read (at least) n newspapers, you are well informed'* entails for any n'>n *'If you read (at least) n' newspapers, you are well informed'*. This line of thought is corroborated by the fact that the presence of NPIs in a notoriously non-monotonic environment (the restrictor of *most*) seems to be contingent on appropriate background assumptions too.

(133) a. *Most mountaineers with any experience (still) need a guide for this tour. [Heim 1984, ex. 35]

b. Most men with any brains eat rutabagas. [Safir 1982, ex. 79b, p. 280]

Definite descriptions appear to exemplify the same patterns as *if*-clauses and the restrictor of *most.* It is reasonable to think that this similarity is not accidental and that *if*-clauses should be analyzed as plural definite descriptions (cf. Lewis 1973, Schein 2001, Schlenker 2003): the restrictor of plural definite descriptions is not monotonic, but can accommodate NPIs under appropriate background assumptions that secure a limited form of DEness which I propose to call pseudo-DEness.

3.8.1.1 Strawson-entailment and the Singular-Plural Difference

Up to this point, and if no other factor determines the licensing of NPIs, the vFL account—modified with the admission of pseudo-DEness—makes the right predictions.[27] Consider plural definite descriptions first. Within the limited DEness afforded

[27]It should be noted that von Fintel (1999) rejects the idea that antecedents of conditionals are non-monotonic on the grounds that strengthening of the antecedent seems to fail, and proposes that they are Strawson downward-entailing. First, he avails himself of the notion of an ever-widening 'modal horizon' modeled by a function from worlds to sets of worlds. The evolution of the modal horizon forms a 'Lewis-sphere' around the evaluation world. The conditional quantifies over a domain of possible worlds which is the intersection of its antecedent with the modal horizon.

by the assumption that dangerous drugs must be stowed securely, and that very dangerous drugs must a fortiori be stowed securely, (134a) Strawson entails (134b), but the converse doesn't hold:

(134) Let P = ⟦drugs that have some hazardous side effects⟧ and Q = ⟦drugs that have many hazardous side effects⟧

a. The drugs that have some hazardous side effects must go into a secure place.

Assertion: *max*(P) must go into a secure place.

Presupposition: *max*(P) exists.

b. The drugs that have many hazardous side effects must go into a secure place.

Assertion: *max*(Q) must go into a secure place.

Presupposition: *max*(Q) exists.

c. (134a) $\not\Rightarrow$ (134b) *(not DE)*

d. (134a) $\overset{Strawson}{\Rightarrow}$ (134b) *(SDE)*

e. (134a) $\overset{Strawson}{\not\Rightarrow}$ (134b) *(not SUE)*

(i) a. For any set of propositions P, we define a strict partial order $<_P$:
$\forall$w', $\forall$w": w'$<_P$w" iff $\forall$p$\in$p (w"$\in$P $\rightarrow$ (w'$\in$p $\wedge$ $\exists$p'$\in$P(w'$\in$p' and w"$\notin$p')))
w' is better than w" according to P iff all propositions in P that hold in w" also hold in w' but some hold in w' that do not also hold in w".

b. <u>Admissible Modal Horizons:</u> A function D from worlds to sets of worlds is an admissible modal horizon w.r.t. the ordering source g iff for any world w, $\forall$w'$\in$D(w): $\forall$w"(w"$\leq_{g(w)}$w' $\rightarrow$ w"$\in$D(w))

c. ⟦ would ⟧^{D,g} (if p)(q)(w) is defined only if (i.) D is admissible w.r.t. g and (ii.) D(w) $\cap$ p $\neq \emptyset$

d. If defined, ⟦ would ⟧^{D,g} (if p)(q)(w) = 1 iff $\forall$w'$\in$D(w) $\cap$ p: q(w) = 1

This monotonic semantics for conditionals fails however to predict the unavailability of NPIs in (129b), (130b) and the like.

The ungrammaticality of NPIs in (128b) and (129b) can be explained by the modified vFL account as the reflection of a lack of SDEness (for want of appropriate background assumptions).

Now consider singular definite descriptions. Two options present themselves. (i.) Either their restrictor is made monotonic in the presence of the appropriate background assumption: then they are SDE, but they are also SUE, and NPIs are thus excluded (which is a welcome result as far as (127a) and the like are concerned). (ii.) Or they are non-monotonic for want of the appropriate background assumption: then they are not SDE, and NPIs are excluded, as desired.

The availability of NPIs in (128a) is not accounted for yet. But suppose that for some reason the existence presupposition is not triggered or is somehow made innocuous: this seems plausible, as the sentence doesn't seem to be making any existential claim. No claim of uniqueness seems to be involved either. In that case, the restrictor of singular *the* is simply DE (therefore SDE) in the limited extent afforded by the appropriate background assumption (e.g. in (128a), the more often you try to grasp the theorem, the more you realize its difficulty).[28]

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[28]Incidentally, if definite descriptions where NPIs are anti-licensed are SDE, SUE in their restrictor, we have yet another argument against operator-based approaches and in favor of environment-based approaches (actually the argument holds even if Strawson-entailment is not linguistically real). Suppose indeed that we add an SDE, non SUE operator above the article, e.g. forming the NEG $>$ THE$_{SG}$ $>$ NPI configuration (by THE$_{SG}$, I mean the singular definite article). The vFL account predicts that the NPI should be licensed, because its licensing condition, which states that the NPI should be in the scope of some SDE, non SUE operator, is obviously met (the condition is not an anti-licensing condition, only a licensing one). But in fact, this prediction turns out to be wrong:

(i) *Context:* Two men are flirting with Mary; one of the two keeps giving her presents, while the other never offered her anything.
*I don't think the man who gave Mary anything is very smart.

vFL couldn't respond by adding a negative rule (an anti-licensing condition) to the effect that the NPI should *not* be in the scope of an SDE, SUE operator. This rule would be immediately falsified by the following grammatical sentence, which illustrates the THE$_{SG}$ $>$ NEG $>$ NPI configuration:

(ii) *Context:* There is some student who knew nothing about linguistics.

3.8.1.2 Facts that Strawson-entailment Cannot Explain

The conservative approach I'm advocating will only be adequate if whenever NPIs are not allowed in the restrictor of a definite description, it is because the context is not strictly DE (for want of an appropriate background assumption, or because a monotonicity-breaking presupposition is factored into the computation of licensing). Despite the apparent success of the vFL account on definite descriptions, I would like to pursue the investigation further, because some intriguing facts point in the direction that I'm defending.

Even when a background assumption secures pseudo-DEness, it is not the case that an NPI can always be licensed in the restrictor of a plural definite description: referential usages of definite descriptions are incompatible with NPIs.

Observe first that episodic contexts are compatible with NPIs in this environment:

(135) The students who had any desire to leave the party did.

This is noteworthy because genericity is not the only way that a definite description can be compatible with an NPI. There is an intuitive relation between the desire that some students had to leave the party and the fact that they actually did (this supplies pseudo-DEness). However, using the description referentially (i.e. as a way to name individuals), as in (136b) and (136c), leads to ungrammaticality:

(136) *Context:* A number of students present at the party wanted to leave as soon as possible.

a. The student who didn't know any linguistics passed all his syntax exams.
b. *Presupposition:* There is some student who knew nothing about linguistics.

So we reach the same conclusion as before regarding the syntactic component of the account: it cannot be correct.

a. —A: What happened, why is the party deserted?

b. —B: *I forgot their names now, but the students who had any desire to leave the party left.

c. —B': *The students who had any desire to leave the party, namely Sarah, Byron and Michael, left.

I submit that these are cases where the existence presupposition cannot be withheld, whereas in all other cases where NPIs appear, it is either not triggered or trivialized (see below). Importantly, these cases of ungrammaticality are out of the reach of the vFL account because the NPI is ungrammatical but its context is not SUE.

I am going to explore the possibility that in cases where NPIs are licensed in a plural definite description (I will talk about singular definite descriptions later), the restrictor of the article is potentially satisfied by a *null entity* (trivialization).[29] This move allows me to preserve the idea that plural definite descriptions trigger an existence presupposition, while at the same time allowing for DEness in certain special conditions.

In a nutshell, trivialization is possible when the speaker is not sure that any actual, non-null, entity satisfies the restrictor; when, as is the case with referential usages, the speaker knows that the domain contains actual, non-null entities, and has a direct acquaintance with them, trivialization is blocked.

Operative in the envisaged mechanism is the introduction of the null entity ε: ε is an atomic individual that exists in the actual world and is part of the domain of individuals D_e but is of cardinality 0. I therefore distinguish the property of being existent from the property of counting as at least 1: ε exists—despite being of cardinality 0—and as such it can satisfy the existence presupposition.

[29] I thank Philippe Schlenker for pointing out trivialization as a possible analysis.

(137) a. For any $P \in D_{et}$: ⟦ Nothing is P ⟧ = 1 iff $P = \emptyset$ or $P = \{ \varepsilon \}$

b. For any $P \in D_{et}$: ⟦ Something is P ⟧ = 1 iff $P \neq \emptyset \wedge P \neq \{ \varepsilon \}$

c. For any $x \in D_e$: ⟦ x exists ⟧ = 1 iff $\{ x \} \cap \{y: y \text{ exists}\} \neq \emptyset$

d. $\varepsilon \leq \varepsilon$

e. For any $x \in D_e$, $x \oplus \varepsilon = \varepsilon$

f. $|\varepsilon| = 0$

g. $max(\{ \varepsilon \}) = \varepsilon$

My goal is to do justice to the speakers' intuitions: faced with sentences like (127b), they feel strongly that the entities that satisfy the restrictor are, if they exist, very rare. I emphasize *'if they exist'*. I assume that the following pragmatic principle applies:

(138) **Principle of Trivialization:** Only count ε as an admissible member of the (contextually restricted) domain of quantification if this doesn't conflict with your knowledge of the world.

Let us look at an example.

(139) a. ⟦ huge desire ⟧ ⇒ ⟦ desire ⟧

b. Let P = ⟦ students with some desire to leave ⟧

c. Let Q = ⟦ students with a huge desire to leave ⟧

d. The students who had some desire to leave the party did.

Assertion: max(P) left.

Presupposition: max(P) exists.

e. The students who had a huge desire to leave the party did.

Assertion: max(Q) left.

Presupposition: max(Q) exists.

f. (139e) $\not\Rightarrow$ (139d) *(not SUE)*

Suppose that the speaker is not sure either about the existence of students with some desire to leave or about the existence of students with a huge desire to leave. In that case, the admission of ε is sanctioned by (138). (139d) and (139e) are necessarily defined; the presupposition of existence is satisfied, albeit trivialized. For any sets R and S such that R $\Rightarrow$ S, *max*(R) $\leq$ *max*(S); therefore entailment obtains from (139d) to (139e). The position of the NPI is therefore DE, leading to licensing.

If trivialization is blocked by (138), the entailment from (139d) to (139e) doesn't go through, because the presupposition of the consequent is no longer guaranteed for all subset-to-set replacements. This is the desired result, as NPIs are not licensed in that case, e.g. (136b) and (136c). Crucially, SUEness is of no avail in the computation of licensing, as the environment is SDE, non SUE. But then the recourse to SUEness loses its raison d'être: it was specifically tailored to explain the pattern of NPI licensing in definite descriptions. It should therefore be rejected; as a result, the usage of Strawson-entailment itself should be rejected, as it leads to severe overgeneration when SUEness is not taken into account. We reach the same conclusion as in 3.4.3 on p. 175.

We can go back to singular descriptions. The requirements of NPIs are strikingly harder to satisfy in their restrictor.

(140) *The student who had any desire to leave the party did.

In light of this fact, it seems to me that we should not allow ε in the denotation of singular NPs. This can be done by stipulating that only individuals of cardinality 1 can be in the donation of singular NPs. We would modify (126d) on p. 189 accordingly:[30]

[30]Notice that if instead of adopting null entities, we pursue the idea that the presupposition of definite descriptions is sometimes not triggered, it is unclear why NPIs are so uncomfortable in singular definite

(141) **Denotation of singular NPs:** The denotation of a singular NP includes only atomic individuals of cardinality 1.

This leaves us with the case of so-called 'generic' singular definite descriptions (128a), (142).

(142) The student who has any books on NPIs sells them (immediately).

Applying the new rule (141) is undesirable, as it bans NPIs from all singular definite descriptions. Unlike all other singular definite descriptions, the generic ones do not trigger a uniqueness presupposition. It seems to me that this is a key to the puzzle. I can only speculate that in generic contexts the singular feature is not interpreted (hence (141) doesn't apply). Singular NPs in generic contexts share with plural NPs the core property that individuals of cardinality other than 1 are admissible in their denotation (this includes of course individuals of cardinality 0).

3.8.2 Appendix II: *Aussi* and Subject NPIs

There is an important fact that needs to be taken into account when looking at the availability of subject NPIs in the presence of the focus particle *aussi:* is the subject position in the scope of the particle or not? In other words is it part of the constituent which serves to generate the presupposition of the particle? This is not always the case.[31] Let us first consider a case in which the subject is in the scope of *aussi*. In

descriptions (especially from the unified perspective initiated by Link (1983)): what has to be explained, if part-time triggering is pursued, is why the presupposition is necessarily triggered in one case but not in the other. It is by no means an implausible route, but I chose to explore the one that seems to me, given my current understanding, more promising.

[31]For expository purposes, when describing the presupposition of *aussi*, I speak in terms of scope of the particle, although the connection between the syntactic position of a presupposition trigger and the nature of its presupposition is poorly understood.

(143a), where the subject is an unmodified existential indefinite, *aussi* takes scopes over the quantifier and its restriction.

(143) *Context:* A meteorite landed in the Pacific Ocean.

a. *Une météorite a aussi atterri dans [l' Océan Atlantique]$_F$.*
a meteorite has too landed in the ocean Atlantic
'A meteorite also landed in [the Atlantic Ocean]$_F$.'

b. *Presupposition:* A meteorite landed in a place other than the Atlantic Ocean.

The set of alternatives comprises propositions of the form 'that some meteorite landed in x' (with x a place), i.e. they each talk about some meteorite, not necessarily the very individual that the original sentence talks about: the existential quantifier is part of the material that enters into the presupposition. In this particular instance, the choice of the predicate blocks a wide scope reading of the subject over *aussi:* it is impossible, for physical reasons, that a given meteorite lands in more than one ocean.

Next, let us consider a case in which the subject is not in the scope of the particle. This happens with modified indefinites with an explicit domain restriction (for a reason that is poorly understood, wide scope of the subject is forced). Interestingly, when this scope obtains, the presupposition of the particle projects universally, i.e. all the individuals that satisfy the restrictor of the quantifier also satisfy the presupposition, as argued in Charlow 2009, which the following example (144a) is translated from:

(144) *Context:* Just five of those 100 students smoke. Those five all smoke Newports.

a. *Deux de ces cinq étudiants fument aussi [des Marlboros]$_F$.*
two of those five students smoke too of-the Marlboros
'Two of those five students also smoke [Marlboros]$_F$.'

b. #Deux de ces 100 étudiants fument aussi [des Marlboros]$_F$.

c. *Presupposition of (144a):* Each of those 5 students smoke cigarettes other than Marlboros.

The oddness of (144b) stems from the fact that the presupposition of a sentence with a modified indefinite subject projects universally:[32] this yields a presupposition failure in the context that we are considering, since only five of the hundred students smoke and smoke something other than Marlboros in that context (the sentence is only felicitous in a context in which each of the 100 students smoke cigarettes other than Marlboros).

With the force of the presupposition, we have a criterion to determine where an indefinite subject scopes w.r.t. the particle *aussi*. This becomes relevant to the present discussion when the indefinite is an NPI. The position of interpretation is not necessarily DE.

Consider the grammatical (145a). The presupposition projects universally (145b), which indicates that the subject has wide scope, by our criterion. The subject contains an NPI, and we verify that it is in a DE position using the schema (146): the presupposition of the premise entails the presupposition of the conclusion, because the restrictor

[32]There is a long-standing debate about the projection of presuppositions triggered *below* a quantifier (Heim 1983, Beaver 1994, 2001, Schlenker 2008). The central question is the following: do those presuppositions project existentially or universally? When the presupposition is triggered in the nuclear scope of a quantifier, the presupposition projects universally (existentially) if all (some of, resp.) the individuals that satisfy the restrictor of the quantifier satisfy the presupposition. The question of the projection out of the nuclear scope of generalized quantifiers has received empirical light from Chemla (2009). I use Chemla's notation (Q is for a generalized quantifier, R for its restrictor, and S for its nuclear scope; the subscript $_p$ in S_p signals that a presupposition is triggered in the nuclear scope).

(i) a. Quantified sentence: $[Q\text{x}: R\text{x}]\ \text{S}_p\text{x}$
b. Universal presupposition: $[\forall\text{x}: R(\text{x})]\ p(\text{x})$
c. Existential presupposition: $[\exists\text{x}: R(\text{x})]\ p(\text{x})$

(ii) a. No student knows that he's lucky.
b. Universal presupposition: Every student is lucky.
c. Existential presupposition: At least one student is lucky.

of a universal quantifier is a DE position:

(145) *Context:* Every neighbor gives piano lessons.

a. *Si quelque voisin que ce soit donne aussi des leçons de*
if some neighbor that this be.SUBJ gives also of-the lessons of
[peinture]$_F$, je pourrai satisfaire mes deux passions dans mon
painting I can.FUT satisfy my two passions in my
immeuble.
building

'If any neighbor gives [painting]$_F$ lessons too, I will be able to satisfy my two passions in my building.'

b. *Presupposition of (145a):* Every neighbor gives lessons of something other than painting.

(146) *Context:* Every neighbor gives piano lessons.

a. ⟦ French neighbor ⟧ ⇒ ⟦ neighbor ⟧

b. If a neighbor also gives [painting]$_F$ lessons, I will be able to satisfy my two passions in my building.

Presupposition: Every neighbor gives lessons of something other than painting.

c. If a French neighbor also gives [painting]$_F$ lessons, I will be able to satisfy my two passions in my building.

Presupposition: Every French neighbor gives lesson of something other than painting.

d. (146b) ⇒ (146c) *(DE)*

When the context satisfies an existential presupposition, as in (147a), only the narrow scope of the subject is possible (because only it gives rise to an existential presupposition):

(147) *Context:* Some neighbor gives private lessons: he teaches piano.

a. #*Si quelque voisin que ce soit donne aussi des leçons de [peinture]$_F$, ...

b. *Si un voisin donne aussi des leçons de [peinture]$_F$, ...*
if a neighbor gives also of-the lessons of painting
'If a neighbor also gives [painting]$_F$ lessons, ... '

c. *Presupposition of (147b):* Some neighbor gives lessons of something other than painting.
N.B.: In this context, a universal projection leads to a presupposition failure: only the existential projection, which corresponds to a narrow scope subject, is possible.

A subject NPI is unavailable, because contradictory demands bear on it. On the one hand, since the context only satisfies an existential presupposition, a wide scope interpretation causes a presupposition failure. On the other hand, interpreting the NPI in the scope of *aussi* leads to ungrammaticality, because the presupposition of a sentence with an indefinite taking narrow scope under *aussi* is a disruptor for NPI licensing, as shown in (148) (the presupposition of the premise doesn't entail the presupposition of the conclusion, because the restrictor of an existential quantifier is not a DE position):

(148) *Context:* Some neighbor gives private lessons: he teaches piano.

a. $[\![$ French neighbor $]\!] \Rightarrow [\![$ neighbor $]\!]$

b. If a neighbor also gives [painting]$_F$ lessons, I will ...

Presupposition: A neighbor gives lessons of something other than painting.

c. If a French neighbor also gives [painting]$_F$ lessons, I will ...

Presupposition: A French neighbor gives lessons of something other than painting.

d. (148b) $\not\Rightarrow$ (148c) *(not DE)*

In sum, a subject NPI is sometimes available with a clausemate *aussi*. But it is only available if it doesn't fall in the scope of the particle, i.e. if it isn't part of the material that forms the presupposition.

CHAPTER 4

Neg-Raising and Positive Polarity: The View from Modals

4.1 Introduction

Among deontic modal verbs, some, e.g. *have to* and *required to,* have obligatory narrow scope under a clausemate negation. Others, i.e. the three deontic modal verbs which are put under the microscope in this article, namely *must, should* and *supposed,* seem at first sight to have a rigid scope over a clausemate negation. This asymmetry is all the more puzzling because the two kinds of modals express the same modality, namely the deontic modality, and have the same quantificational force (they are all universal quantifiers).

How can certain verbs achieve wide scope over negation? It is important to answer this question in order to understand the workings of negation in natural language, and to have a better grasp of the architecture of the clause. An immediate hypothesis is that wide scope takers are generated above negation. This article shows that we do not need to postulate a different base-generation position to account for the variation across the aforementioned verbs. In fact, all three wide scope takers (*must, should* and *supposed*) are Positive Polarity Items which are able to scope out (I call them 'mobile PPIs'): they cannot stay in the scope of a clausemate negation, where they are generated, and they raise past the offender, while other PPIs (e.g. *would rather, had better*), have no

other option but to stay in that position and get anti-licensed.

Establishing an exact typology of verbs according to their behavior with respect to negation requires that we have at our disposal reliable diagnostic tools: it is the main goal of this article to design those tests. Thanks to them, it is possible to tell apart neg-raising—neg-raisers, e.g. *think* and *want*, do not move past negation but achieve semantic wide scope through an excluded middle inference—from PPIhood. This is how the polarity sensitivity of *must*, *should* and *supposed*, can be demonstrated. Another fact is established: *should* has a dual nature, i.e. it is both a neg-raiser and a mobile PPI; and in a certain dialect of English, *supposed* is also a neg-raiser, but a part-time one. The particular conditions under which it allows a neg-raised construal shed some light on the mechanisms of neg-raising itself.

The structure of the article is the following. Section 4.2 is a detailed exploration of the neg-raising phenomenon. The criteria it supplies are used in section 4.3 to show that deontic *must* is not a neg-raiser; the section also provides positive tests that show that it is a mobile PPI. The way is paved for the exploration of the more complex modal verb *should:* its dual nature (neg-raiser and mobile PPI) is brought to light in section 4.4. *Supposed* exhibits, in the dialect of certain speakers, an even more subtle character (4.5): it is a neg-raiser, but manifests this property only when certain pragmatic conditions are met.

4.2 Background: Neg-raising

4.2.1 Homogeneity

The verbs *want* and *think* are said to be neg-raising predicates (NRPs). This means that, when negated, they are preferentially—but not necessarily—interpreted as having semantic scope over negation, as shown in the paraphrases below. By contrast, the

predicates *desire* and *be certain* are not NRPs:

(1) a. John doesn't want to help me.

(i) *Paraphrasable as:* John wants not to help me.

(ii) *Paraphrasable as:* John doesn't have the desire to help me.

b. John doesn't desire to help me.

Not paraphrasable as: John desires not to help me.

(2) a. John doesn't think that he's competent.

(i) *Paraphrasable as:* John thinks that he is not competent.

(ii) *Paraphrasable as:* John doesn't have the belief that he's competent.

b. John is not certain that he is competent.

Not paraphrasable as: John is certain that he is not competent.

There is a long history of research on the topic. Early proposals in the generative tradition (under the name of 'Negative Transportation theories', Lakoff 1969) took the near synonymy between e.g. (1a) and (1ai) at face value and held that the wide scope of NR predicates over negation is achieved by syntactic means, i.e. negation in (1a) and (2a) originates in a low base-position (in the embedded clause), at which it is eventually interpreted after reconstruction.

This purely syntactic view is hard-pressed to explain neg-raising with negative quantifiers, e.g. *no one* and *never:*

(3) a. No one wants to help me.

b. *Paraphrasable as:* Everyone wants not to help me.

(4) a. John never wants to help me.

b. *Paraphrasable as:* John always wants not to help me.

(3a) and (4a) are preferentially interpreted as meaning (3b) and (4b) respectively. Here again, it seems that negation is interpreted in the scope of the embedding predicate; what is surprising though is that the paraphrases contain positive universal quantifiers (*every* and *always*). If interpreting negation in the embedded clause is all there is to neg-raising, then the facts are inexplicable. The reason is that if negative quantifiers spell out negation and an existential quantifier (as is now standardly assumed, cf. Jacobs 1980, Ladusaw 1992, Geurts 1996, de Swart 2000, Zeijlstra and Penka 2005, Penka 2007, Iatridou and Sichel 2008 a.o.[1]), the reading that the negative transportation hypothesis (i.e. syntactic neg-raising) predicts is inadequate. It is given in (5b) below; (5c) is the paraphrase of the result of reconstructing the entire negative quantifier (negation and the existential quantifier). Not only is the actual reading not derived, but the two readings obtained by reconstruction are simply unavailable.

(5) a. NEG_1 someone want [t_1 help]

b. Someone wants not to help me.

c. (There) wants no one to help me.

The syntactic accounts are therefore insufficient. Semantic alternatives were proposed very early on: the intuition they developed, dating back to Bartsch 1973, is that neg-raising predicates are true either of their complement or of its negation, in other words they give rise to an excluded middle or homogeneity inference. After Heim (2000), Gajewski (2005) proposes that this inference is a lexical presupposition: it is lexical, because only certain predicates are neg-raisers (cf. the difference between *want* and *desire*). I give a semantics for the verb *want* in the spirit of his proposal. First of all, I define Boul(x,i,w), the set of bouletic alternatives of individual x in world w at time

[1]This hypothesis is inspired by cases of so-called Neg-split reading in Dutch, German and English, cf. Homer 2010a, Chapter 2 of this dissertation.

i:[2]

(6) When #, Boul(x,i,w) is a set of triples of $D_e \times D_i \times D_s$:

Boul(x,i,w) = {<x',i',w'>: <x',i',w'> is compatible with what x wants in w at i}

The third disjunct in the definedness condition of the following lexical entry is the homogeneity presupposition:

(7) $[\![\text{want}]\!]^{c,s} = \lambda p_{eist}.\lambda x_e.\lambda i_i.\lambda w_s.$ # if (i) Boul(x,i,w)=# or (ii) for some <x',i',w'>∈Boul(x,i,w), p(x')(i')(w')=# or (iii) it is not the case that either for each <x',i',w'>∈Boul(x,i,w) p(x')(i')(w')=1 or for each <x',i',w'>∈Boul(x,i,w) p(x')(i')(w')=0;

if ≠ #, 1 iff for each <x',i',w'>∈Boul(x,i,w) p(x')(i')(w')=1

Adopting this perspective makes the movement of negation useless: under this view negation is base-generated and interpreted in the same clause as the NRP and above it; the neg-raising effect is due to the computation of a homogeneity presupposition in concert with the assertive content of the sentence. Combining the assertive content and the homogeneity presupposition gives the desired result first for non-quantified sentences:

(8) a. John doesn't want to help me.

[2]For expository purposes, I present here the excluded middle inference as being a lexical presupposition triggered by an NRP; but I will discuss a possible alternative, cf. section 4.5.

b. (i) *Assertion:* It is not the case that John wants to help me.

(ii) *Homogeneity presupposition:* John wants to help me or John wants not to help me.

∴ John wants not to help me.

Turning to sentences with quantified subjects of the form [[*Q*(x): *R*(x)] want'(p,x,i,w)], *each* individual x is such that x either wants *p* or its negation: the presupposition of the predicate is assumed to project universally.[3] Under this assumption, we correctly predict the attested (and favored) reading of (9a) given in (9b):[4]

(9) a. No one wants to help me.

b. *Paraphrasable as:* Everyone wants not to help me.

c. *Paraphrasable as:* No one desires to help me.

d. (i) *Assertion:* It is not the case that there is an x such that x wants to help me.

(ii) *Projection of the homogeneity presupposition:* For every x, either x wants to help me or x wants not to help me.

∴ Everyone wants not to help me.

---

[3]See Chemla 2009 for experimental data that show that presuppositions project universally in the nuclear scope of negative universal quantifiers.

[4]Assuming that the homogeneity presupposition holds at all times, we derive the neg-raised reading of (4a)—repeated below—in a parallel fashion:

(i) a. John never wants to help me.

b. (i.) *Assertion:* It is not the case that there is a time t at which John wants to help me.

(ii.) *Projection of the homogeneity presupposition:* Either at all times t John wants to help me at t or at all times t John wants not to help me at t.

∴ John always wants not to help me.

By the same token, we derive the neg-raised reading of (10a) given in (10b). This *existential wide scope reading,* which is usually absent from discussions of neg-raising, is a hallmark of neg-raisers and will be used as a test in our investigation of the scope of *must, should* and *supposed*:

(10) a. Not everyone wants to help me.

b. *Paraphrasable as:* There are some people who want not to help me.

c. *Paraphrasable as:* Not everyone desires to help me.

d. (i) *Assertion:* It is not the case that everyone wants to help me.

(ii) *Projection of the homogeneity presupposition:* For every x, either x wants to help me or x wants not to help me.

∴ There is some x such that x wants not to help me.

4.2.2 Cyclicity

A remarkable property of neg-raising predicates is that they can be interpreted as having semantic scope over a superordinate negation, as illustrated below:

(11) a. I don't think that John wants to help me.

b. *Paraphrasable as:* I think that John wants not to help me.

This narrow-scope interpretation of a surface superordinate negation is only possible with certain embedding verbs, namely verbs that are themselves neg-raisers, hence the name 'cyclic neg-raising' for the phenomenon. But not all NRPs lend themselves to cyclic neg-raising. While *think* does, *want* doesn't.

(12) a. I don't want John to think that I'm angry.

b. *Not paraphrasable as:* I want John to think that I'm not angry.

Gajewski (2005), p. 53 ff., convincingly argues that the projection of presuppositions explains the unequal availability of cyclic neg-raising with the desire predicate *want* and with the doxastic predicate *think* (Karttunen 1974 and Heim 1982), and offers the following account. The presuppositions triggered in the complement of a doxastic predicate, e.g. *think*, hold in all the doxastic alternatives that the predicate quantifies over.

For example the definite description *his cello* in (13a) triggers an existence presupposition (=there exists a cello that belongs to Bill):

(13) a. Bill will sell his cello.
b. *Presupposition:* Bill has a cello.

When (13a) is embedded under *think*, as in (14a), the resulting sentence presupposes that in all of Bill's doxastic alternatives, Bill has a cello (and it also presupposes that Bill has a cello).

(14) a. Bill thinks he will sell his cello.
b. *Presupposition:* Bill thinks he has a cello.

The presuppositions triggered in the complement of a desire predicate, e.g. *want*, hold in the *doxastic* alternatives of the subject of the desire predicate, not in her bouletic alternatives. In the case at hand, *Bill wants to sell his cello* presupposes that Bill thinks that he has a cello (and it also presupposes that he has one), not that he wants to have one.

(15) a. Bill wants to sell his cello.
b. *Presupposition:* Bill thinks he has a cello.

Doesn't presuppose: Bill wants to have a cello.

In light of these facts, we can now have a better grasp of cyclicity (and lack thereof) with NR predicates: assuming that the excluded middle inference is a presupposition, we expect that it will project differently under *think* and under *want.*

(16) [I don't think [John wants [to help me]$_{\gamma}$]$_{\beta}$]$_{\alpha}$

a. *Assertion of* α*:* It is not the case that I think that John has a desire to help me.

b. *Homogeneity presupposition triggered by* think *in* α*:*
I think that John has a desire to help me or I think that John doesn't have a desire to help me.

c. *Homogeneity presupposition triggered by* want *in* β*:*
John has a desire to help me or John has a desire not to help me.

d. *Projection of the homogeneity presupposition triggered in* β*:*
I think that John has a desire to help me or John has a desire not to help me.

(16a) and (16b) together entail (17):

(17) I think that John doesn't have a desire to help me.

(17) and (16d) together entail (18):

(18) I think that John has a desire not to help me.

(18) is the reading of (16) that obtains by cyclic neg-raising, as desired. Now consider what happens if *think* is embedded under *want:*

(19) [I don't want [John to think [I'm angry]$_\gamma$]$_\beta$]$_\alpha$

a. *Assertion of α:* It is not the case that I want John to think I'm angry.

b. *Homogeneity presupposition triggered by* want *in α:*
I want John to think I'm angry or I want it not to be the case that John thinks I'm angry.

c. *Homogeneity presupposition triggered by* think *in β:*
John thinks I'm angry or John thinks I'm not angry.

d. *Projection of the homogeneity presupposition triggered in β:*
I think that John thinks I'm angry or John thinks I'm not angry.

(19a) and (19b) together entail (20):

(20) I want it not to be the case that John thinks I'm angry.

(20) and (19d) do not entail together (21):

(21) I want John to think I'm not angry.

In contradistinction to what happens with a doxastic embedding attitude, the projection of the presupposition triggered in the embedded clause doesn't combine with (20) to yield (21).

4.2.3 Lack of Neg-raising

The presupposition approach appears to capture the data adequately. There is however a question that needs to be addressed. The neg-raising construal of verbs like *want* and *think* doesn't seem to be necessary. (22a) is felicitous (and (23a) is too) although it doesn't necessarily have the meaning paraphrased in (22b) ((23b) resp.). No

presupposition failure seems to occur.

(22) a. I envy my great-grandparents: unlike many people nowadays they didn't want to spend all their spare time on internet.

b. My great-grandparents wanted not to spend all their spare time on internet.

(23) *Context:* At a job interview…

a. I don't want to make a lot of money, you know.

b. I want not to make a lot of money.

It is well-known that presuppositions can be prevented from projecting by being satisfied locally. The only plausible way the homogeneity presupposition could be satisfied in (22a) and (23a) is if it is silently included in the assertive content in the scope of negation (this is what is traditionally called 'local accommodation', cf. Heim 1983):

(24) #The King of France is bald.

Presupposition: There exists a King of France.

(25) The King of France is not bald, because there is no King of France.

Presupposition: None.

Accommodation in (25): It is not the case that (there is a King of France and that he is bald), because there is no King of France.

(26) Bill doesn't think that Sue is here.

Presupposition: Bill thinks either that Sue is here or that Sue is not here.

(27) Bill doesn't think that Sue is here. He has no opinion.

Hypothetical accommodation in (27): It is not the case that (Bill thinks either

that Sue is here or that Sue is not here and that Bill thinks that Sue is here). He has no opinion.

Local accommodation is not very well understood. It is typically invoked to account for lack of projection when the presupposition is explicitly denied in a continuation, as in (25). It could equally well be invoked about (27). But the facts in (22a) and (23a) are not exactly, it seems, of the same nature as those in (25) and (27). If we try to block the projection of the presupposition that there exists a King of France by inserting the sentence that carries it in the same frame in which the homogeneity presupposition fails to project in (22a)-(23a), we still get a presupposition failure:

(28) a. #Unlike many people, the King of France is not bald.

b. #The King of France is not bald, you know.

This suggests that there could be a difference between the presupposition attached to definite descriptions and the presupposition attached to neg-raisers. Alternatively, one can hypothesize that the homogeneity presupposition is not triggered in (22a)-(23a). It is not clear why this should be so, but we cannot exclude this option absolutely, given that the workings of presupposition 'cancellation' have not been fully elucidated yet. The lack of projection in (22a)-(23a) is reminiscent of what happens with the presupposition trigger *stop:* (29b) is another case where one hesitates between the local accommodation approach and the non-triggering one.

(29) a. John has stopped smoking.

Presupposition: John used to smoke.

b. *Context:* John, who I met a minute ago, seems to be a very agressive person. I wonder why this is so…

Has John stopped smoking or something?

Presupposition: None.

Summary

To sum up, I have presented in this section the main properties of neg-raising predicates and shown that the semantic approach to the phenomenon is more adequate than the syntactic one: a neg-raiser achieves wide scope over negation *while being in the syntactic scope of negation* all along. An analysis in terms of presupposition makes the right predictions about the cyclicity phenomenon. If this analysis is correct, lack of neg-raising in certain cases can be explained either as an instance of local accommodation or as an instance of non-triggering of the homogeneity presupposition. We will draw heavily on this discussion in the rest of the article: we now have criteria to recognize neg-raisers and tell them apart from other wide scope takers, namely mobile PPIs.

4.3 Deontic *must* is a PPI

In this section, I show that (i.) deontic *must* is a PPI[5] and that (ii.) it is not a neg-raiser.

In certain configurations, such as (30), deontic *must* necessarily outscopes a clausemate negation and negative quantifiers.

(30) a. John mustn't jog. MUST>NEG;*NEG>MUST

b. No one must jog. MUST>NEG;*NEG>MUST

The problem of the scope of *must* has not received much attention in the literature

[5]The claim that $must_{deon}$ is a PPI was first made in Israel 1996 (and more recently in Iatridou and Zeijlstra 2009), but had never been established empirically, as far as I know. The demonstration presented here elaborates on Homer 2010b.

(de Haan 1997). The wide scope of *must* is generally assumed to be absolutely rigid (for Horn (1989), it is somehow lexically encoded). But there are other items which, in certain configurations, can only be interpreted outside of the scope of a clausemate negation or a negative quantifier. The quantifier *some* is one of them:

(31) When Fred speaks French...

a. ...Jean-Paul doesn't understand something. SOME>NEG;*NEG>SOME

b. ...no one understands something. SOME>NEG;*NEG>SOME

Because of this very restriction, *some* is described as being a Positive Polarity Item (Szabolcsi 2004 a.o.). Negative Polarity Items of the *any*-type need to be interpreted in a constituent which is downward-entailing with respect to their position. In Homer 2010a (Chapter 2 of this dissertation), I show that *some* has the opposite requirement: it needs to be interpreted in a constituent which is not downward-entailing with respect to its position.[6] If certain items are unable to scope under negation because they are polarity sensitive, it is natural to think that deontic *must* is one of them; the rest of this section establishes that this hypothesis is indeed correct, and it does so through a close comparison with the distributional pattern of a well-known PPI, namely *some*. I also discuss and dismiss the most sensible alternative hypotheses—*must* is base-generated above negation, or *must* is a neg-raising predicate.

In Homer 2010a, I explain that a PPI π^+ is licensed in sentence S only if there is a constituent β of S such that π^+ is not in a downward-entailing (DE) environment in β. Not all constituents are eligible for the checking of licensing, though: for example only the constituents which contain the Pol head are eligible for the licensing of *some*

[6]Previous researchers claim that *some* is anti-licensed in Anti-additive environments.

(PolP is a constituent whose specifier is filled with negation when the polarity of the clause is negative). In (31) as well as in (31b), PolP contains a negation which makes the position of the PPI *some* downward-entailing, leading to anti-licensing.

The conditions under which deontic *must* and *some* can be interpreted under a negation are strictly parallel.

4.3.1 Superordinate Negation

Deontic *must* and *some* can be interpreted under a superordinate negation. Let us first consider *some:*

(32) It's impossible that John stole something. ✓NEG > SOME

The availability of the narrow scope reading of *something* in (32), in contrast with (31), is easily explained by the principles that I lay out in Homer 2010a (to which the reader is referred for details): in the former, *something* is licensed in an eligible constituent that doesn't contain negation, namely the embedded clause, and this is sufficient since a PPI must find at least one constituent in which it is not in a downward-entailing environment. In the latter on the other hand, there is no such constituent, since the smallest possible constituent on which licensing is checked is PolP, and it contains the negation.

Observe that *must* can have a narrow scope interpretation in (33a) but not in (33b):

(33) a. It's impossible that John must$_{deon}$ jog. ✓NEG > MUST

b. John must$_{deon}$ not/must$_{deon}$n't jog. *NEG > MUST

This contrast is compatible with an analysis of *must*$_{deon}$ as being a PPI. It poses a challenge to the hypothesis that it is a neg-raiser: although neg-raisers can perfectly take narrow scope under a superordinate negation (like *must*$_{deon}$) and maybe have to do so under superordinate *impossible* ((34b) is the meaning of (34a) that is predicted to obtain under neg-raising, assuming that the homogeneity presupposition projects universally under the negative world quantifier *impossible:* it doesn't seem to be a natural reading of (34a)), they can be interpreted under a clausemate negation (22a)-(35), unlike *must*$_{deon}$ (33b):

(34) a. It's impossible that John wants to jog. ✓NEG > WANT

b. In every possible world, John wants not to jog.

(35) John doesn't want to jog. ✓NEG > WANT

Paraphrasable as: John doesn't desire to jog.

What discriminates between the two theoretical options is that *must*$_{deon}$ cannot take wide scope over a superordinate negation when it is embedded under a negated doxastic neg-raiser:

(36) a. The doctor doesn't think that John must$_{deon}$ jog. *MUST>NEG

Not paraphrasable as: The doctor thinks that John is required to not jog.

b. No one thinks that John must$_{deon}$ jog. *MUST>NEG

Not paraphrasable as: Everyone thinks that John is required to not jog.

In this respect, *must*$_{deon}$ stands in sharp contrast with *want.* Recall that *want* can outscope negation when it is embedded under a negated epistemic neg-raiser, e.g. *think* or *believe* (cyclicity).

(37) a. The doctor doesn't think that John wants to jog.

Paraphrasable as: The doctor thinks that John wants not to jog.

b. No one thinks that John wants to jog.

Paraphrasable as: Everyone thinks that John wants not to jog.

These facts are inconsistent with the hypothesis that $must_{deon}$ is a neg-raiser but substantiate the hypothesis that it is a PPI.

4.3.2 Rescuing

It is not the case that *some* can never take narrow scope under a clausemate negation. There are at least two conditions under which this scope is possible: either there is another downward-entailing expression outscoping *some* (this is called 'rescuing'), or a quantifier intervenes between *some* and the offending negation (this is known as 'shielding'). First I examine rescuing, with the downward-entailingness inducers *few people*, *impossible* and *only:*

(38) When Fred speaks French...

a. ...few people don't understand something. ✓NEG > SOME

b. ...it's impossible that Jean-Paul doesn't understand something. ✓NEG > SOME

c. ...only Marie doesn't understand something. ✓NEG > SOME

In each of the above, there is a constituent which is not downward-entailing with respect to the position of *some:* in (38a) for example, the maximal constituent (= main TP) is upward-entailing with respect to *some,* as a result of the composition of two downward-entailing functions. This suffices to license the PPI.

With deontic *must*, similar configurations allow a narrow scope reading of the modal under a clausemate negation.[7][8]

(39) a. (Speaking about a five-year-old boy, whose parents are very demanding.)
–This poor kid does so many chores: he must$_{deon}$ empty the dishwasher, feed the dog, clean his bedroom, make his bed...
–Yes, you're right, and I'm not sure that he must$_{deon}$n't rake the leaves

[7]There is some variation across speakers. Although all English speakers accept narrow scope readings of deontic *must* when the modal is 'shielded' by a quantifier like *every* and *always*, for some speakers, rescuing is very hard if not impossible. The same speakers find rescuing with *some* possible but less than optimal, which might be a clue towards an explanation.

[8]In Homer 2010e, I show that deontic modals (and more generally root modals) create biclausal structures. It is therefore important to use contracted forms of negation in the examples that support the investigation of the relation between *must* and negation. With non contracted forms, the position of negation is uncertain: it can be either in the matrix clause or in the embedded clause, as shown in the logical forms below:

(i) John must not jog.
a. [...not must [...John jog]]
b. [...must [...not John jog]]

Since we are interested in the interaction between *must* and clausemate negation, it is important to exclude embedded negations (a point that Iatridou and Zeijlstra (2010) fail to take into account). When negation is contracted, it is interpreted in the main clause. To see this, consider abilitative *could:* this modal is not always interpreted under the negation that it is linearized after. With contracted negation, only the narrow scope of the modal is possible, which indicates that negation is interpreted in the matrix.

(ii) John could not jog.
a. [...not could [...John jog]]
b. [...could [...not John jog]]

(iii) John couldn't jog.
a. [...not could [...John jog]]
b. *[...could [...not John jog]]

With deontic *must*, the question of whether negation is in the matrix or in the embedded is hard to answer unless we use contracted forms (in which case we know that it is in the matrix). The position of interpretation of negation is not easily traced on semantic grounds because *must* can outscope a clausemate negation (through movement, as I argue in Homer 2010b).

too. ✓NEG > NEG > MUST$_{deon}$

b. I know that John's condition imposes drastic precautions, but even then I'm not sure that he mustn't rake the leaves. ✓NEG > MUST$_{deon}$ >NEG

(40) a. The coroner does nothing that must$_{deon}$n't be done over again, he is so unbelievably incompetent! ✓NEG > NEG > MUST$_{deon}$

b. The coroner is the most competent person I know but this is a free country: he does nothing that must$_{deon}$n't be done over again. ✓NEG > MUST$_{deon}$ > NEG

(41) a. Few boys mustn't read this very long book. ✓FEW > NEG > MUST$_{deon}$; ✓FEW > MUST$_{deon}$ > NEG

b. Only John mustn't read this very long book. ✓ONLY > NEG > MUST$_{deon}$; ✓ONLY > MUST$_{deon}$ > NEG

These facts are incompatible with the hypothesis that *must* is base-generated above negation (also with the hypothesis that *must* necessarily moves past negation for interpretation). The conditions that allow it to stay in its low base-generation position are related to the logical properties of the context (i.e. its monotonicity): rescuing occurs when a constituent where the modal is in an upward-entailing position is made available (by the composition of two downward-entailing functions).[9] This suggests that it is a PPI. Furthermore, given that its base position is below negation, we are led to hypothesize that it QRs to move out of the scope of an offending negation (this is what I propose to label 'escaping' in Homer 2010b).

[9]Remarkably, the intermediate scope of *must* between the two DE expressions is possible, as illustrated in (39b) and (40b); for a discussion of this fact, see Homer 2010a.

4.3.3 Shielding

Some is said to be shielded from negation when certain quantifiers intervene: in Homer 2010a, I adopt Chierchia's (2004) proposal that the indirect scalar implicatures that strong scalar terms give rise to in DE environments are monotonicity-breakers (when they are factored into the meaning that is relevant for the licensing of polarity items): as such their intervention is fatal to NPIs, and beneficial to PPIs. *Every* sits at the strong end of the scale <some, every>: it is a strong scalar term. Existential quantifiers such as the NPI *a single person* are weak scalar terms, and as such, they do not trigger an indirect scalar implicature: *a single person* doesn't shield *some:*

(42) a. Not everyone understands something. ✓NEG > EVERY > SOME

b. Not a single person understands something. *NEG > A_SINGLE > SOME

Let us take some time to examine *not everyone.* It is unlikely to be a constituent: it is not available in object position (**I saw not everyone*) and it allows Neg-split (which is used as evidence for the analysis of negative quantifiers as comprising sentential negation and an existential quantifier):

(43) *Context:* Words of wisdom found on a management consultant's blog.
Although each member is entitled to be on the board, not everybody can be on the board. ✓NEG > CAN > EVERY

Therefore there is reason to think that the constituency of (42a) is as follows (assuming that Pol is lower than T):

(44) LF: $[_{TP}$ T $[_{PolP}$ not [everyone$_2$ [something$_1$ t$_2$ understand t$_1$]]]]

Strikingly, the narrow scope reading of *must* under negation is not only possible, it is mandatory, when *every* intervenes:[10]

(45) a. Not everyone must jog. ✓NEG > EVERY > MUST_{deon}; *MUST_{deon} > NEG > EVERY

b. Not a single person must jog. *NEG > A_SINGLE > MUST_{deon}; ✓MUST_{deon} > NEG > A_SINGLE

This strongly suggests that *must* is sensitive to the modification that the presence of *every* brings to the monotonicity of its context, which is a hallmark of a polarity item. Observe that the wide scope reading of *must* is not only possible but mandatory when *everyone* is replaced with the existential weak scalar term *a single person* (45b). This minimal pair confirms that the lack of wide scope of *must* in (45a) is due to a difference in monotonicity.[11]

Importantly, we do not observe a reading that obtains with neg-raising predicates under *not every* (cf. (10a) repeated below as (47a)):

(46) a. Not everyone must jog.

b. *Not paraphrasable as:* There is some x such that x is required not to jog.

(47) a. Not everyone wants to help me.

[10]For a discussion of this blocked movement, see Homer 2010a.

[11]I do not know why a neg-split reading of (45a) is impossible (given that it is possible with the existential modal *can*, cf. (43)). If it were possible, a wide scope reading of *must* would be expected to obtain: once *every* reconstructs, i.e. ceases to intervene, the environment of the modal is negative and escaping has to take place:

(i) [must_2 [not t_1 t_2 every_1 . . .]]

The same phenomenon (lack of a neg-split reading), recurs with *supposed*, cf. section 4.5.

b. *Paraphrasable as:* There is some x such that x wants not to help me.

Recall that the wide scope existential reading of (47a) given in (47b), typical of neg-raisers, is derived through the addition of an excluded middle inference. It should be available in (46a) if deontic *must* were a neg-raiser too: therefore we have yet another reason to dismiss the hypothesis that deontic *must* is a neg-raiser.

Certain speakers of English allow for the reconstruction of subject *every* under negation; the same speakers can interpret (48b) with *every* taking intermediate scope between the negation and the modal after reconstruction.

(48) a. Everything isn't expensive. ✓NEG>EVERY

b. Everything must$_{deon}$n't be expensive to be worthwhile.

✓NEG> EVERY>MUST$_{deon}$

c. [t_1 not everything$_1$ must [t_1 be_expensive]]

The universal quantifier over times *always* also shields *some* and *must*, while the existential *ever* doesn't.

(49) When Fred speaks French...

a. ...Jean-Paul doesn't always understand something/*anything.

✓NEG > SOME

b. ...Jean-Paul doesn't ever understand something/ anything.

*NEG > SOME

(50) (Speaking of guitars...)

a. One mustn't always go with 'new' to get 'good'.[12]

✓NEG>ALWAYS>MUST$_{deon}$

b. One mustn't ever go with 'new' to get 'good'.

*NEG>EVER>MUST$_{deon}$; ✓MUST$_{deon}$>NEG>EVER

Lastly, the universal adverb *necessarily* also has this protective effect:

(51) a. When Fred speaks French, Jean-Paul doesn't necessarily understand something/*anything. ✓NEG>NECESSARILY>SOME

b. The show must$_{deon}$n't necessarily go well, but it must$_{deon}$ go on.[13]

✓NEG>NECESSARILY>MUST$_{deon}$

Summarizing, deontic *must* shares with the PPI *some* three key properties, which suggest that it is itself a PPI:

1. It has narrow scope under a superordinate negation (*must* cannot take wide scope over a superordinate negation; *some* can, presumably through a choice function

[12]The original example can be found here: http://forum.saxontheweb.net/showthread.php?21845-Good-clarinet-for-beginning-clarinet-student.

The narrowest scope of *always* is also possible. It obtains when the adverb is generated in the embedded clause (due to the linearization of the modal before negation, only meaning is a reliable guide to tell where the adverb is interpreted):

(i) You're too credulous. You mustn't always believe what you are told.
[$_{TP}$ must$_1$ not t$_1$ [$_{TP}$ always ...]

[13]Iatridou and Zeijlstra (2010) examine a similar example taken from Homer 2010b, and claim that it has a modal concord reading, 'where the two modals are felt to yield one single semantic modal'. I fail to see this reading: if modal concord means that only one of the two modals is interpreted, the sentence should mean the same as (ia) or (ib) below, contrary to fact. Rather, it has the meaning of (ic):

(i) a. It is not necessarily the case that the show goes well.
b. It is not the case that the show must go well.
c. It is not necessarily the case that the show must go well.

The caveat about the placement of the adverb *always* in fn. 12 (either in the matrix or in the embedded) applies to *necessarily* as well.

construal, cf. Reinhart 1997);

2. It can be ‘rescued’ from a clausemate negation by another DE expression;

3. It is shielded by strong scalar terms.

These facts are inconsistent with the hypothesis that *must* is base-generated above negation (or has to be interpreted in a position higher than negation). The first fact—together with the lack of a wide scope existential reading in (46a)—is incompatible with the hypothesis that it is a neg-raiser.

I have claimed that *must* scopes out to avoid being in a negative environment. It is possible to show that it is indeed in a position higher than negation when it is interpreted with wide scope. We use a quantifier and examine whether it can take scope below *must* and above negation (it is essential to use a contracted negation for the test to show anything, cf. fn. 8; the use of a non-monotonic quantifier is also necessary, see Appendix II, 4.7.2):

(52) *Context:* The rules of this bowling game state that exactly one pin must remain standing, no matter which one...

Exactly one pin mustn’t be knocked down.

MUST_{deon}>EXACTLY_ONE>NEG

Paraphrasable as: It is necessary that there is exactly one pin (no matter which one) that is not knocked down.

The availability of the intermediate scope of *exactly one* (the pins may vary across possible worlds) indicates that the quantifier is sandwiched between the modal and negation. Therefore *must* achieves wide scope by syntactic means. The validity of the test is confirmed by the fact that a non specific reading of the modified indefinite is not available in (53) despite the equivalence between $\Box\neg$ and $\neg\Diamond$:

(53) Exactly one pin cannot be knocked down.

Not paraphrasable as: It is necessary that there is exactly one pin (no matter which one) that is not knocked down.

It is not possible to derive the intermediate scope reading of (52) using a homogeneity presupposition. The only way for this option to be at least viable would be to reconstruct the subject quantifier into the complement of the modal.[14] The resulting meaning is not even a possible reading of the sentence.

(54) a. [t_1 not must [[exactly_one pin]$_1$ be_knocked_down]]

b. (i) *Assertion:* It is not the case that it is required that exactly one pin be knocked down.

(ii) *Hypothetical homogeneity presupposition:* It is required that exactly one pin be knocked down or it is forbidden that exactly one pin be knocked down.

∴ It is forbidden that exactly one pin be knocked down.

Summary

To sum up, deontic *must* is a PPI. It achieves wide scope over a clausemate negation by syntactic means: it can be shown that it is interpreted in a syntactic position that is higher than negation whenever it outscopes a clausemate negation. Therefore $must_{deon}$

[14]Without reconstruction, the meaning that obtains is as follows. It is a possible reading of the sentence, although not the one we are after.

(i) a. [[exactly_one pin] not must [be_knocked_down]].

b. (i) *Assertion:* There is exactly one pin such that it is not required to knock it down.

(ii) *Hypothetical homogeneity presupposition:* For each pin, it is either required that it be knocked down or it is forbidden that it be knocked down.

∴ There is exactly one pin such that it is forbidden to knock it down.

is what I call a mobile PPI, i.e. a PPI which can QR past an offender (the prototypical offender is clausemate negation). The next section investigates *should* and shows, using the criteria that we have under our belt, that it is both a neg-raiser and a mobile PPI.

4.4 The Dual Nature of *should*

We now have tests to determine whether or not a given predicate is a neg-raiser and other tests to determine whether or not it is a PPI. Using them, I am going to show that *should* has a dual nature: it is concomitantly a neg-raiser and a PPI.

4.4.1 *Should* is a Neg-raiser

To establish that deontic *should* is a neg-raiser, we use the cyclicity test.[15] Recall that a neg-raiser embedded under a negated doxastic neg-raiser can be interpreted as having wide scope over negation (4.2.2): of the three deontic modals *should*, *have to* and *must*, only *should* gives rise to cyclicity. This is a first step in the demonstration that it is a neg-raiser:

(55) a. I don't think that John should$_{deon}$ marry Susan.
Paraphrasable as: I think that John shouldn't marry Susan.

b. I don't think that John has to marry Susan.
Not paraphrasable as: I think that John has to not marry Susan.

c. I don't think that John must$_{deon}$ marry Susan.
Not paraphrasable as: I think that John must$_{deon}$n't marry Susan.

[15]The claim that *should* is a neg-raiser—and that *must* is not—is not new. It is already made in Horn 1989. Note 37, p. 578 (in the 2001 edition) substantiates the claim with a cyclicity test.

We do not know a priori if *should* is a PPI or not. It is conceivable—and actually true in fact—that it is both a neg-raiser and a PPI. If should is a PPI, it can unproblematically be interpreted in the scope of a superordinate negation. The cyclicity test can thus apply without risk of interference from the effects of the potential PPIhood of the modal. By the same token, we can neutralize the effects of the putative PPIhood of *should* by placing an intervener under an offending negation. Recall that deontic *must* is a PPI: when it is shielded from negation by a universal quantifier, it doesn't have to raise and in fact, it cannot cf. (45a) on p. 225 and Homer 2010a. In the configuration NEG>EVERY>SHOULD (as well as in NEG>NECESSARILY>SHOULD and NEG>ALWAYS>SHOULD), we predict that the properties of the neg-raiser *should* will shine through. And this is exactly what happens: we observe that the reading of the logical form in (56b) is one where there is an existential quantification outside of the scope of the modal (this is a *de re* reading), just like in (10a) on p. 211. I assume that the presupposition triggered in (56b) is modeled after the homogeneity presupposition that is postulated for *think* and *want*.

(56) a. Not everyone should get a flu shot.

b. [not [everyone$_1$ should [t$_1$ get_flu_shot]]]

c. (i) *Assertion:* It is not the case that everyone should get a flu shot.

(ii) *Projection of the homogeneity presupposition:* For every x, either x should get a flu shot or x should not get a flu shot.

∴ There is some x such that x should not get a flu shot.

(57) *Control:*

a. Not a single person should get a flu shot.

b. *Only paraphrasable as:* It should be the case that no one gets a flu shot.

To ascertain whether sentence (56a) does have this wide scope existential reading, we check that it can be coherently inserted in a discourse of this kind:

(58) —Doctor A: Not everyone should get a flu shot.

—Doctor B: I totally disagree. It is not true that there are people that we should leave unvaccinated. I'm really shocked, and I can tell you I won't tolerate any discriminations in this hospital.

Sentence (56a) also has a non neg-raised reading paraphrasable as (59), just like (1a) has the non neg-raised reading (1aii):

(59) It is not the case that every x is such that x should get a flu shot.

4.4.2 *Should* is a PPI

Is deontic *should* a PPI? Nothing in principle precludes that it is both a neg-raiser and a PPI. And we happen to have a test to decide whether a modal takes syntactic scope over negation, a hallmark of mobile PPIs (not every PPI is able to raise: in the dialects in which *would rather* is a PPI, it is simply unacceptable under a clausemate negation, which indicates that it cannot raise, unlike *must*). We apply the test to the simple case where *should* is in the scope of a clausemate negation.

(60) *Context:* The rules of this bowling game state that exactly one pin must remain standing, no matter which one...

Exactly one pin shouldn't be knocked down.

✓SHOULD>EXACTLY_ONE>NEG

The test is positive, therefore we conclude that *should* is a PPI: in the presence of a clausemate negation, it is through raising that it achieves wide scope over negation (unless it is shielded, in which case neg-raising kicks in, cf. (56a)). When *should* is rescued, it can still outscope negation: we know that this is also true of *must* (cf. (39b) and (40b) on p. 223) therefore in the case of *should*, it is difficult to determine whether intermediate scope between two DE expressions, one of which is a clausemate negation as in (61b), is due to neg-raising or to QR of the PPI:

(61) a. The coroner does nothing that should$_{deon}$n't be done over again, he is so unbelievably incompetent! ✓NEG > NEG > SHOULD$_{deon}$

b. The coroner is the most competent person I know but this is a free country: he does nothing that should$_{deon}$n't be done over again.

✓NEG > SHOULD$_{deon}$ > NEG

This property of being a PPI explains why *should* behaves differently from other neg-raisers. Recall that in section 4.2.3 on p. 214 we observed that neg-raising is optional under a clausemate negation with *want* (62a) (this is also true of *think*). *Should* simply never takes narrow scope under a clausemate negation (62b), except when it is shielded or rescued. Only in those latter two cases is neg-raising possible, but importantly, not necessary (62c). Otherwise neg-raising doesn't get to apply, because *should* is a PPI which has to QR past an offending negation (and neg-raising requires that the NR predicate be in the scope of negation). If we assume that *want* and *think* are pure neg-raisers (i.e. not PPIs[16]), the discrepancy between them on the one hand and *should* on the other is explained away.

[16]This hypothesis seems reasonable, since they can be interpreted under a clausemate negation without shielding nor rescuing. In Appendix I (4.7.1) however, I show that there are some reasons to suspect that *want* is a PPI, but a PPI of a special brand: it can unproblematically stay under a clausemate negation. The reasoning presented in the text is not affected.

(62) a. I envy my grandparents: unlike many people nowadays they didn't want to spend all their spare time on internet. (22a)

b. I envy my kids: unlike me, they should not jog.

Not paraphrasable as: Unlike me, they are not required to jog.

c. Not everyone should jog.

Paraphrasable as: Not everyone is required to jog. (no neg-raising)

Also paraphrasable as: There is some x such that it is required that x doesn't jog. (neg-raising)

To sum up, deontic *should* appears to be both a neg-raiser and a PPI. Its nature of neg-raiser is manifest only when it appears in a configuration where no polarity violation occurs (i.e. under a superordinate negation or under a shielder like *every*). In the simple case where it is generated in the scope of a clausemate negation, it achieves wide scope through raising, due to its nature of mobile polarity item. The next section compares *must* (a pure PPI) and *should* (a PPI and a neg-raiser at the same time) and shows that *should* is clearly assessor dependent, while the assessor dependence of *must* is more problematic. I submit that this difference opens up new perspectives, and might further our understanding of neg-raising itself.

4.4.3 Assessor Dependence of *should*

Should is special among deontic modals in that it is assessor dependent (to the best of my knowledge, this claim is new): the modal evaluation it encodes is relativized to some salient individual. For a sentence of the form [should Φ] this individual is the source of the norm with respect to which Φ does or doesn't hold. This assessor is the speaker in a simple unembedded sentence, and it is the subject of the embedding verb when the modal is placed under an attitude verb. To make the dependence conspicuous,

I create an infelicity using a continuation which contradicts the assessor dependence.

(63) a. #Hermann should$_{deon}$ marry Zelda, but I don't have an opinion about this marriage.

b. Hermann should$_{deon}$ marry Zelda, but you don't have an opinion about this marriage.

(64) a. #Fred$_i$ thinks that Hermann should$_{deon}$ marry Zelda, but he$_i$ doesn't have an opinion about this marriage.

b. Fred thinks that Hermann should$_{deon}$ marry Zelda, but I don't have an opinion about this marriage.

(65) a. #Hermann$_i$ met a woman that he$_i$ should$_{deon}$ marry, but I don't have an opinion about this marriage.

b. Hermann$_i$ met a woman that he$_i$ should$_{deon}$ marry, but you don't have an opinion about this marriage.

This property sets it apart from two other universal deontic modals, namely *have to*, and—this is of more direct relevance to the present discussion—*must*$_{deon}$:

(66) a. Hermann must$_{deon}$ marry Zelda, but I/you don't have an opinion about this marriage.

b. Hermann has to marry Zelda, but I/you don't have an opinion about this marriage.

(67) a. Fred$_i$ thinks that Hermann must$_{deon}$ marry Zelda, but he$_i$/I do(es)n't have an opinion about this marriage.

b. Fred$_i$ thinks that Hermann has to marry Zelda, but he$_i$/I do(es)n't have an opinion about this marriage.

(68) a. Hermann$_i$ met a woman that he$_i$ must$_{deon}$ marry, but I don't have an opinion about this marriage.

b. Hermann$_i$ met a woman that he$_i$ has to marry, but I don't have an opinion about this marriage.

The behavior of *should*$_{deon}$ bears a striking resemblance to that of epistemic modals, e.g. *might*$_{epis}$ and *must*$_{epis}$ (unlike the facts about *should*$_{deon}$, the following observations are well-known):

(69) a. #The key might$_{epis}$ be in the drawer, but it's not.

b. #The key might$_{epis}$ be in the drawer, but I think it's not.

c. The key might$_{epis}$ be in the drawer, but you think it's not.

(70) a. #Fred$_i$ thinks that the key might$_{epis}$ be in the drawer, but he$_i$ thinks it's not.

b. Fred thinks that the key might$_{epis}$ be in the drawer, but I think it's not.

(71) a. #Fred met a woman who might$_{epis}$ be French, but she's not.

b. #Fred met a woman who might$_{epis}$ be French, but I think she's not.

c. Fred met a woman who might$_{epis}$ be French, but you think she's not.

Epistemic modals are standardly described as being assessor dependent (MacFarlane 2003, Moltmann 2005, Egan et al. 2005, Stephenson 2007), i.e. their accessibility relation is not only relativized to a world of evaluation, but also to an individual, whose belief state in the world of evaluation determines which possible worlds are accessible. In order to derive the identity between the assessor of an epistemic modal and the author of the context (either the matrix context or the embedded context), I assume that the assessor is realized in syntax as a PRO (I stipulate that *might*$_{epis}$ and *must*$_{epis}$ select

for a PRO as opposed to any other kind of variable).[17]

Let us see how this works with *might*$_{epis}$. For unembedded *might*$_{epis}$, we need to bind the assessor variable: this requires a binder at the top of the matrix clause.[18] I posit that matrix clauses are headed by a silent complementizer which acts as a binder of individuals, times and worlds: the bound variables are mapped to the author (c_a), the time (c_t) and the world (c_w) of context c respectively (a context is a triple of an author, a time of thought or utterance and a world of thought or utterance).

(72) a. $[\![[C_{k,l,m}\ S]]\!]^{c,s} = \lambda x_e.\lambda i_i.\lambda w_s.\ [\![S]\!]^{c,s[x_k \rightarrow x][i_l \rightarrow i][w_m \rightarrow w]}$

b. It is raining.

c. $[C_{1,2,3}\ w_3\ i_2$ rain]

d. $[\![(72c)]\!]^{c,s} \neq$#;

=1 iff it is raining in c_w at c_t.

To define *might*, we need to use epistemic alternatives: the epistemic alternatives of an individual x at time i in world w are the set of pairs <i',w'> compatible with x's beliefs in w at i.

(73) When $\neq$ #, Ep(x,i,w) is a set of pairs of $D_i \times D_s$:

Ep(x,i,w) = {<i',w'>: <i',w'> is compatible with what x believes in w at i}

(74) $[\![\text{might}]\!]^{c,s} = \lambda p_{ist}.\lambda x_e.\lambda i_i.\lambda w_s.$ # iff (i) Ep(x,i,w)=# or (ii) for some <i',w'>$\in$Ep(x,i,w), p(i')(w')=#;

1 iff $\neq$# and for some <i',w'>$\in$Ep(x,i,w), p(i')(w')=1

[17]See Stephenson 2007 for a technically different implementation of the same idea.

[18]I use an extensional system with indexed abstractors over variables which are syntactically represented, *à la* Percus 2000.

Recall that we stipulate that the individual argument of *might* is a PRO. We can now derive the meaning of a simple unembedded sentence. (75a) is true in context c if and only if at least one of the author of c's epistemic alternatives is such that it is raining at this alternative.

(75) a. It might be raining.

b. $[C_{1,2,3}\ w_3\ i_2\ PRO_1$ might $[\lambda_4\ \lambda_5\ w_5\ i_4$ rain$]]$

c. $[\![$ (75b) $]\!]^{c,s} \neq$#;

=1 iff for some <i',w'>$\in$Ep(c_a,c_t,c_w), it is raining in w' at i'.

Let us now consider a case of embedding under *think.* We need to define first the set of doxastic alternatives of x at i in w Bel(x,i,w) (it is important that doxastic alternatives be triples with an individual coordinate because we want to ensure that the assessor of embedded *might* is interpreted *de se*):

(76) When $\neq$ #, Bel(x,i,w) is a set of triples of $D_e \times D_i \times D_s$:

Bel(x,i,w) = {<x',i',w'>: <x',i',w'> is compatible with what x believes in w at i}

I assume that the complementizer of the embedded clause acts as a binder (just like the covert complementizer at the top of a matrix clause):

(77) $[\![$ [think that$_{k,l,m}$ F] $]\!]^{c,s}$ = $[\![$ think $]\!]^{c,s}$ ($\lambda x_e.\lambda i_i.\lambda w_s.$ $[\![$ F $]\!]^{c,s[x_k \rightarrow x][i_l \rightarrow i][w_m \rightarrow w]}$)

(78) $[\![$ think $]\!]^{c,s}$ = $\lambda p_{eist}.\lambda x_e.\lambda i_i.\lambda w_s.$ # iff (i) Bel(x,i,w)=# or (ii) for some <x',i',w'>$\in$Bel(x,i,w), p(x')(i')(w')=# or (iii) it is not the case that either for each <x',i',w'>$\in$Bel(x,i,w) p(x')(i')(w')=1 or

for each <x',i',w'>∈Bel(x,i,w)

p(x')(i')(w')=0;

1 iff ≠# and for each <x',i',w'>∈Bel(x,i,w),

p(x')(i')(w')=1

(79) a. Fred thinks that it might be raining.

b. [$C_{1,2,3}$ w_3 i_2 Fred thinks [$that_{4,5,6}$ w_6 i_5 PRO_4 might [λ_7 λ_8 w_8 i_7 rain]]]

c. $[\![$ (79b) $]\!]^{c,s}$ ≠#;

=1 iff for each <x',i',w'>∈Bel(f,c_t,c_w),

$[\![$ [w_6 i_5 PRO_4 might [λ_7 λ_8 w_8 i_7 rain]] $]\!]^{c,s[x_4 \rightarrow x'][i_5 \rightarrow i'][w_6 \rightarrow w']}$,

iff for each <x',i',w'>∈Bel(f,c_t,c_w),

there is some <i",w">∈Ep(x',i',w') s.t. it is raining in w" at i".

I propose to apply a similar treatment to deontic *should.* I assume that the modal base associated with this modal is made up of <time,world> pairs compatible with what some individual deems right (in a moral or legal sense[19]). This individual is the authority whose point of view is critical in determining what counts as the norm. The individual argument of $should_{deon}$ is a PRO. First of all, we define the relevant kind of deontic alternatives:

(80) When ≠ #, Sh(x,i,w) is a set of pairs of $D_i \times D_s$:

Sh(x,i,w) = {<i',w'>: <i',w'> is compatible with what is right according to x in w at i}

(81) $[\![$ should $]\!]^{c,s}$ = $\lambda p_{ist}.\lambda x_e.\lambda i_i.\lambda w_s$. # iff (i) Sh(x,i,w)=# or (ii) for some <i',w'>∈Sh(x,i,w), p(i')(w')=#;

[19]This is an obvious oversimplification of the meaning of *should.* For an interesting proposal and for a review of previous attempts, I refer the reader to Copley 2006.

1 iff $\neq$# and for each <i',w'>$\in$Sh(x,i,w), p(i')(w')=1[20]

(82) a. John should leave.

b. [$C_{1,2,3}$ w_3 i_2 PRO_1 should [λ_4 λ_5 w_5 i_4 John leave]]

c. $[\![$ (82b) $]\!]^{c,s}$ $\neq$#;

=1 iff for each <i',w'>$\in$Sh(c_a,c_t,c_w), John leaves in w' at i'.

(83) a. Fred thinks that John should leave.

b. [$C_{1,2,3}$ w_3 i_2 Fred thinks [$that_{4,5,6}$ w_6 i_5 PRO_4 should [λ_7 λ_8 w_8 i_7 John leave]]]

c. $[\![$ (83b) $]\!]^{c,s}$ $\neq$#;

=1 iff for each <x',i',w'>$\in$Bel(f,c_t,c_w), $[\![$ [w_6 i_5 PRO_4 should [λ_7 λ_8 w_8 i_7 John leave]] $]\!]^{c,s[x_4 \rightarrow x'][i_5 \rightarrow i'][w_6 \rightarrow w']}$,

iff for each <x',i',w'>$\in$Bel(f,c_t,c_w),

for each <i",w">$\in$Sh(x',i',w') John leaves in w" at i".

In the case of *must*$_{deon}$, the presence of an assessor argument is uncertain. We have seen that neither the author nor the addressee of the context has to be an authority in that case. It is possible that an assessor argument exists however, but is unspecified. We need further data to adjudicate on this issue. My assumption in the semantics I give for *must*$_{deon}$ is that it does have an assessor argument.

First, I define the relevant set of deontic alternatives (the same treatment would apply to *have*$_{deon}$ *to* mutatis mutandis):

[20] I do not include a homogeneity presupposition, because the comparison between *supposed* and *should* indicates that it might not be part of the lexical entry but rather is pragmatically conditioned, cf. 4.5.3.

(84) When $\neq$ #, Mu(x,i,w) is a set of pairs of $D_i \times D_s$:

Mu(x,i,w) = {<i',w'>: <i',w'> is compatible with what is right according to x in w at i}

(85) $[\![\text{must}]\!]^{c,s} = \lambda p_{ist}.\lambda x_e.\lambda i_i.\lambda w_s.$ # iff (i) Mu(x,i,w)=# or (ii) for some <i',w'>$\in$Mu(x,i,w), p(i')(w')=#;

1 iff $\neq$# and for each <i',w'>$\in$Mu(x,i,w), p(i')(w')=1

(86) a. John must leave.

b. $[C_{1,2,3}\ w_3\ i_2\ pro_4$ must $[\lambda_4\ \lambda_5\ w_5\ i_4$ John leave]]

c. $[\![$ (86b) $]\!]^{c,s} \neq$#;

=1 iff for each <i',w'>$\in$Mu(s(4),c_t,c_w), John leaves in w' at i'.

The observations that we have made so far converge towards a generalization (in the form of a necessary, non sufficient, condition):

(87) **Generalization:** Only assessor dependent predicates are neg-raisers.

The following list of neg-raising predicates provided in Horn 1978 conforms with the generalization (caveat: *supposed* is in fact a special case as we will see shortly).

(88) [OPINION] think, believe, expect, suppose, imagine, reckon

[PERCEPTION] seem, appear, look like, sound like, feel like

[PROBABILITY] probable, likely, figure to

[INTENTION/VOLITION] want, intend, choose, plan

[JUDGMENT/OBLIGATION] supposed, ought, should, desirable, advise

All these predicates can be analyzed as having accessibility relations relativized to an individual (for the predicates that are not raising verbs, the assessor is always the individual denoted by the subject). However assessor dependence is by no means sufficient. We know this independently of the consideration of modals. Other assessor dependent predicates, e.g. *certain, guess, hope* etc. are not neg-raisers. And among modal verbs, besides deontic *must* (for which the evidence about its assessor dependence is insufficient) there are uncontroversial assessor dependent predicates that are not neg-raisers. This is true of epistemic *must* in American English (in this dialect, (89) is actually felt to be deviant).

(89) #I don't think that John must$_{epis}$ be very intelligent. [American English]
Not paraphrasable as: I think that it is very likely that John is not very intelligent.

In British English however, *must*$_{deon}$ is a neg-raiser, and thanks to the cyclicity of neg-raising, the sentence is felicitous when neg-raising is applied to the embedding verb and to *must* (similarly in my dialect of French, *devoir*$_{epis}$ is a neg-raiser while *devoir*$_{deon}$ is not).

(90) I don't think that John must$_{epis}$ be very intelligent. [British English]
Paraphrasable as: I think that it is very likely that John is not very intelligent.

And even in British English, no existential epistemic predicate is a neg-raiser and some universal ones are not (this is also true of American English):

(91) a. I don't think that John might be very intelligent.
Not paraphrasable as: I think that it is possible that John is not very

intelligent.

b. #I don't think that John has$_{epis}$ to be very intelligent.

Not paraphrasable as: I think that it is very likely that John is not very intelligent.

Notice that the generalization is not so easy to falsify: one needs to find a neg-raising predicate which unequivocally lacks an assessor argument and we know, from the inspection of *must*$_{deon}$, that showing the absence of this argument is difficult.

Summary

To sum up, we have established in this section that deontic *should* is both a neg-raiser and a PPI, and shown that it is assessor dependent.

In the next section, I explore the neg-raising properties of the deontic modal *supposed* in two dialects of English. This predicate is enlightening because in both dialects it is assessor dependent but it is a neg-raiser only in one of them (in that dialect neg-raising is only possible under certain pragmatic conditions, hence the label of 'part-time neg-raiser').

4.5 *Supposed*$_{deon}$: A PPI and a Part-time Neg-raiser

Supposed$_{deon}$, like *must*$_{deon}$ and *should*$_{deon}$, takes obligatory wide scope over a clausemate negation (unless a strong scalar term intervenes).

(92) a. John is not supposed to jog. *NEG>SUPPOSED; SUPPOSED>NEG

b. No one is supposed to jog. *NEG>SUPPOSED; SUPPOSED>NEG

c. You're never supposed to jog. *NEVER>SUPPOSED; SUPPOSED>NEVER

There are two dialects to consider, dialect A and dialect B.

4.5.1 Dialect A: A Pure PPI

In A, *supposed* is not a neg-raiser (this is why it is a 'pure' PPI: it has a simple nature). It fails the cyclicity test:

(93) I don't think that John is supposed to jog. [Dialect A]

Not paraphrasable as: I think that it is necessary that John doesn't jog.

It also doesn't allow a wide scope existential reading when it appears under *not every* (this is a *shielding* configuration in which neg-raising of predicates that are both NRPs and PPIs can occur: compare with *should* in (56a)):

(94) Not everyone is supposed to get a flu shot. [Dialect A]

NEG>EVERY>SUPPOSED; *SUPPOSED>NEG>EVERY

Not paraphrasable as: There are some people who are such that it is necessary that they don't get a flu shot.

The fact that the wide scope of *supposed* w.r.t. negation is impossible in (94) suggests, together with the necessary wide scope in (92a)-(92c) above and (95) below that it is a PPI.[21]

[21] If *supposed* is, as I claim, a PPI, this fact is at variance with a theory like Iatridou and Zeijlstra's (2010). For these authors, all English modals raise to T (head movement) and then reconstruct for interpretation, unless they are prevented from doing so for reasons of polarity sensitivity. According to them, in (ia) the modal reconstructs obligatorily and gets interpreted in its final position; in (ib) this reconstruction movement is blocked because the landing position is in the scope of an offending clausemate negation.

(i) a. John cannot smoke.
b. John mustn't smoke.

(95) Not a single person is supposed to jog. [Dialect A and B]

*NEG>SUPPOSED; SUPPOSED>NEG

This hypothesis is confirmed by the fact that it can take narrow scope under a clausemate negation when this negation is itself outscoped by another one (this is a case of rescuing).

(96) *Context:* Same as in (39). [Dialect A and B]

I'm not sure that John is not supposed to rake the leaves too.

✓NEG > NEG > SUPPOSED

Furthermore, a quantifier subject can take intermediate scope between the modal and a clausemate negation (in that order), suggesting that the modal undergoes QR (this movement is blocked in case of shielding (94) and obligatory otherwise (95)):

(97) *Context:* The rules of this bowling game state that exactly one pin must remain standing, no matter which one...

Exactly one pin is not supposed to be knocked down. [Dialect A and B]

✓SUPPOSED>EXACTLY_ONE>NEG

This view holds that the linearization of the modal before the negative marker is an indication that at some level of representation the modal takes scope over negation: in the case of *supposed*, wide scope of the modal occurs while the modal is linearized after negation, a fact that the theory is not suited to explain. The view that modals achieve wide scope through head-movement also poses a compositionality problem (I thank Rajesh Bhatt for pointing this out to me). Assuming that modals head-move to T, functional application cannot combine a modal and T, since T has the right type to take as argument a constituent γ which contains the modal prior to movement. In the unlikely event that the modal and γ happen to be of the same type, the result of combining T and the modal cannot have the appropriate type to combine with γ.

4.5.2 Dialect B: A Part-time Neg-raiser

In Dialect B, *supposed* is a PPI and a neg-raiser (but we will see that it is only a 'part-time' neg-raiser). First of all, it can be rescued (96) and it takes syntactic scope over a clausemate negation (it passes the test in (97)), which shows that it is a PPI. But under certain conditions it allows a wide scope existential reading with universal quantifiers intervening under negation, and it passes the cyclicity test, which are two hallmarks of NRPs. What are these conditions? Consider the following paradigms:

(98) a. Not everyone is supposed to win the lottery. [Dialect A and B]
Not paraphrasable as: There are some people for whom it is necessary that they do not win the lottery.

b. Not everyone is supposed to jog. [Dialect B only]
Paraphrasable as: There are some people for whom it is necessary that they do not jog.

c. Not everyone is supposed to get a flu shot. [Dialect B only]
Paraphrasable as: There are some people for whom it is necessary that they do not get a flu shot.

(99) a. I don't think that you're supposed to win the lottery. [Dialect A and B]
Not paraphrasable as: I think that it is necessary that you do not win the lottery.

b. I don't think that you're supposed to jog. [Dialect B only]
Paraphrasable as: I think that it is necessary that you do not jog.

c. I don't think that you're supposed to get a flu shot. [Dialect B only]
Paraphrasable as: I think that it is necessary that you do not get a flu shot.

The typical neg-raising behavior is only observed in [$_S$ not supposed to *p*] if a command about the proposition expressed by *p* is plausible in the context of utterance of *S*. Speakers of dialect B explain that they have the intuition that the existence of some agency—who passes a judgment about the proposition denoted by *p*—is postulated. In the case at hand, it is easy to imagine that (98b)-(98c) and (99b)-(99c) are uttered against the background of a doctor's recommendation: jogging can be detrimental to some people, those at risk of a heart failure for example, and some people are intolerant of flu shots. In (98a) and (99a), it is hard to conceive of an agency issuing a similar command about winning the lottery.

This suggests that *supposed* is likely to be assessor dependent: some individual's point of view matters. It is clear that the assessor, if she exists, need not be the author nor the addressee of the context; this can be shown using our continuation test (the results are the same in Dialect A and Dialect B):

(100) a. Hermann is supposed$_{deon}$ to marry Zelda, but I/you don't have an opinion about this marriage.

b. Fred$_i$ thinks that Hermann is supposed$_{deon}$ to marry Zelda, but he$_i$/I do(es)n't have an opinion about this marriage.

The following contrast suggests not only that an assessor associated with *supposed* exists, but that it is actually assumed *not* to be the author of the context:

(101) *Context:* —A: Why do you take all those vitamins?...

a. —B: #My doctor thinks that I'm supposed to take vitamins.

[Dialect A and B]

b. —B': My doctor thinks that I should take vitamins.

While (101b) is natural, (101a) is odd because the doctor should be the authority judging whether vitamins are good or bad for the speaker, but the sentence implies that he is not. The passive form of *supposed* might play a role in explaining the difference between *should* and *supposed* with regard to the identity of the assessor. I assume that the latter is an obligatorily passivized ECM predicate, and I submit that its external argument (the assessor argument), is, just like with other verbs in the passive, arbitrary PRO (Collins 2005) (or a silent non specific SOMEONE, cf. Kayne's (2008) analysis of unaccusative verbs). The same reason, whatever it is, that explains why the external argument of a verb in a short passive is by default interpreted as being non-coreferential with the speaker (102), also explains the preferential anti-author orientedness of *supposed.*

(102) This book was written in 2002.

In the same connection, when asked to compare the following four sentences, consultants have a strong intuition that in (103d) an individual other than the speaker (=the author of the context) is the judge of the necessity for the speaker to leave the party.

(103) *Context:* At a party at 2 a.m.. . .

a. I must go now.

b. I have to go now.

c. I should go now.

d. I'm supposed to go now.

I propose the following lexical entry for $supposed_{deon}$ and provide an example below (I stipulate that the external argument of *supposed* is PRO_{arb}):

(104) When $\neq$ #, Su(x,i,w) is a set of pairs of $D_i \times D_s$:

Su(x,i,w) = {<i',w'>: <i',w'> is compatible with what is right according to x in w at i}

(105) $[\![$ supposed $]\!]^{c,s} = \lambda p_{ist}.\lambda x_e.\lambda i_i.\lambda w_s$. # iff (i) Su(x,i,w)=# or (ii) for some <i',w'>$\in$Su(x,i,w), p(i')(w')=#;
1 iff $\neq$# and for each <i',w'>$\in$Su(x,i,w), p(i')(w')=1

(106) a. John is supposed to leave.

b. [$C_{1,2,3}$ w_3 i_2 PRO_{arb} supposed [λ_4 λ_5 w_5 i_4 John leave]]

c. $[\![$ (106b) $]\!]^{c,s}$ $\neq$#;
=1 iff for each <i',w'>$\in$Su($[\![PRO_{arb}]\!]$,c_t,c_w), John leaves in w' at i'.

4.5.3 Hypotheses about the Source of Neg-raising

Being a part-time neg-raiser (in Dialect B), *supposed* offers some insights in the triggering of the neg-raising phenomenon, but I must say that no firm conclusion emerges yet from the data that I have collected. Neg-raising with *supposed* in Dialect B appears to be conditional on the accessibility of a plausible point of view, and it conforms with our Generalization (87). But it is important to notice that *supposed* seems to be assessor dependent in Dialect A as well, although in that dialect it is not an NRP. Therefore generalization (87), which is a necessary condition, is corroborated, but a number of questions are left open, in particular: why isn't *supposed* a neg-raiser at all in certain dialects (namely Dialect A)? I think that an appropriate answer to this question is beyond the scope of this article. But the examination of modal predicates confirms an intuition shared by some (notably by Horn (1989)) that strength is of the essence: it

seems that the non neg-raiser *must*$_{deon}$ is in some sense stronger than the neg-raiser *should*$_{deon}$, and that *have*$_{epis}$ *to* is stronger than *must*$_{epis}$ (in British English the latter is a neg-raiser but the former is not). In the same connection, the command in (107c) and (107d) below is intuitively weak to the point that it can be bypassed without jeopardizing the achievement of the goal, namely running the marathon: in (107a) and (107b) on the other hand, the rule is unavoidable. I notice that the divide between the two pairs is also a divide between neg-raisers and non neg-raisers.

(107) *Context:* If you want to run the marathon…

a. You must train every day.

b. You have to train every day.

c. You should train every day.

d. You're supposed to train every day.

Unfortunately, I cannot say anything more substantial than that at this point.

The other key question is of course: why is *supposed* only a part-time neg-raiser? Here I will content myself with presenting the various hypotheses that can be entertained, given our current understanding of neg-raising and of presupposition. In preamble, I think that the comparison between *should* and *supposed* is useful: these modals are very close in meaning as well as in their argument structure. But neg-raising is always possible with *should* (unless it is shielded), while it is sometimes impossible with *supposed*.

(108) a. Not everyone is supposed to be a millionaire. [Dialect B]
Unless appropriate context, not paraphrasable as: There is some individual x such that it is necessary that x is not a millionaire.

b. Not everyone should be a millionaire. [Dialect A and B]

Paraphrasable as: There is some individual x such that it is necessary that x is not a millionaire.

If we assume, after Gajewski (2005), that neg-raising is always due to a homogeneity presupposition, we are led to postulate that the homogeneity presupposition triggered by *supposed* doesn't project in (98a), (99a) and (108a). This means either (i.) that it is not triggered or (ii.) that it is triggered but accommodated locally. We have seen a case where adjudicating between the two options is difficult (29b); but here, the comparison between *should* and *supposed* is not in favor of the first option: it is not clear at all why the presupposition of the latter would fail to be triggered more easily than that of the former. The second option is perhaps less mysterious: one could imagine that the presupposition of *supposed* is easily accommodated in contexts where no individual seems to have an opinion about the proposition expressed by the complement of the modal (this is how a presupposition failure is avoided); this is maybe more difficult to imagine about the author of the context. There are other grammatical facts about which the opinionatedness of the speaker is invoked: the derivation of scalar implicatures in the Gricean framework relies on this assumption. The proponents of this line (Russell 2006, Geurts 2009b) also assume that the opinionatedness of the subject of (certain) embedding verbs accounts for implicatures triggered in the scope of those verbs. Here is an example: it is the assumption that the speaker believes that George is opinionated that allows the derivation of a conversational inference in the scope of an intensional operator in (109) (B_S stands for 'the speaker believes that' and B_G for 'George believes that').

(109) George believes that some of his advisors are crooks.

a. *Implicature:* $B_S \neg B_G$[all of G's advisors are crooks]

b. *Assumption:* $B_S B_G$[all of G's advisors are crooks] $\vee$ $B_S B_G \neg$[all of G's

advisors are crooks]

c. $\therefore$ $B_S B_G \neg$[all of G's advisors are crooks] [Geurts 2009a, p. 34]

Although the assumption that subjects of attitude verbs are opinionated is not needed in the rival framework, namely the grammatical view (Chierchia et al. 2008), which claims that embedded implicatures exist and derive them using exhaustifying operators, it is not excluded either.

If the opinionatedness of certain distinguished individuals is part of the background assumptions of the participants in a conversation, it is at least plausible that an asymmetry between assessors (authors of contexts are always assumed to be opinionated, others are not) can explain why the presupposition of *supposed*, whose assessor is some unspecified individual, is easily accommodated (to avoid a presupposition failure) while that of *should*, whose assessor is the author of the context, is satisfied in every context of utterance (and therefore projects unproblematically). The contrast between the two sentences (108a)-(108b) would stem from the fact that local accommodation is forced in the former for want of an obvious opinionated assessor (unless the sentence is uttered in a context where someone is assumed to know the conditions for being a suitable millionaire) but unnecessary in the latter (the speaker is assumed to know what the conditions for being a good millionaire are).

Having said this however, it seems that the facts could just as well be derived without even invoking a homogeneity *presupposition.* It seems that the assumptions about the opinionatedness of the assessors of NR predicates are redundant with the homogeneity presupposition and that the latter need not be postulated. There is one glitch, however: we already know that certain predicates are clearly assessor dependent (and have the author of the context as their assessor) but fail to be neg-raisers (e.g. epistemic modals in American English). Therefore whoever wants to pursue the line that the trig-

gering of neg-raising with *supposed* is entirely pragmatic (no lexical presupposition is needed) and proposes to extend this view to all known neg-raisers, must explain why the typology of NRPs is as it is. This leads us back to the first puzzle above (p. 249).

4.6 Conclusion

This article offers a case study of the scopal properties of three deontic modal verbs with respect to negation. It shows that *must*, *should* and *supposed* are mobile PPIs and that *should* is also a neg-raiser (while *supposed* exhibits the neg-raising behavior only in certain dialects and provided that the opinionatedness of some individual is assumed in the context of utterance). The typology is presented in Table 4.1.

	Is a PPI	Can QR	Is a Neg-raiser
$must_{deon}$	yes	yes	no
$should_{deon}$	yes	yes	yes
$supposed_{deon}$	yes	yes	English$_A$: no English$_B$: yes
$have_{deon}$ *to*	no	no	no

Table 4.1: Properties of Some Modals

The next step is to explain this typology. There are a number of new questions that this investigation raises. The most evident questions are: why are certain verbs PPIs while others are not? And why are certain verbs neg-raisers while others are not? Also crucial is the question of the movement of verbs: QR is only postulated about individual quantifiers, not about world quantifiers. What part of a modal moves? And where to? I hope to have laid the foundations for this new research program.

4.7 Appendix

4.7.1 Appendix I: Does *want* Have a Dual Nature Too?

In Homer 2010a, I show that the licensing of polarity items is environment-based. I propose the following licensing condition:

(110) **Licensing Condition of Polarity Items:** A PI π is licensed in sentence S only if it is contained in at least one eligible constituent A of S which has the monotonicity properties required by π w.r.t. the position of π and all other PIs in A are licensed within A.

As I explained on p. 218, the smallest possible constituent upon which the licensing of *some* is checked (this is what in Homer 2010a I call the smallest possible domain of *some*) is PolP. We showed that this is also the case of deontic *must.*

4.7.1.1 French Deontic *devoir*

In French as well, there is a universal deontic modal which takes scope over a clausemate negation, namely *devoir.* But it can also be interpreted below it (Homer 2010b).

(111) *Marc ne doit*$_{deon}$ *pas parler à Léa.*
Marc NEG must NEG talk to Léa
'Marc mustn't talk to Léa.' or *'Marc doesn't have to talk to Léa.'*

It can be shown that *devoir*$_{deon}$ can QR past a clausemate negation, because a subject quantifier can be sandwiched between the two. This is a hallmark of mobile PPIs:

(112) *Context:* The rules of this bowling game state that exactly one pin must remain standing, no matter which one…

Exactement une de ces quilles ne doit$_{deon}$ pas être renversée.
exactly one of those pins NEG must.PRES NEG be knocked-down
'Exactly one of those pins mustn't be knocked down.'

DEVOIR$_{deon}$ > EXACTLY_ONE > NEG

Since the narrow scope of *devoir$_{deon}$* is always possible, a number of tests that we used to show that *must* can have narrow scope under a clausemate negation (and is therefore a probable mobile PPI rather than an item base-generated higher than negation) are uninformative in French. There is one important exception. We can show that *devoir$_{deon}$*, just like *must$_{deon}$*, can be forced to take narrow scope when it is shielded (we have observed that QR of *must* is blocked under *not every* (46a) on p. 225). We use the universal quantifier *toujours* 'always' and ensure that it is in the matrix clause together with negation and *devoir$_{deon}$*, by substituting a pronoun for the embedded clause (right dislocation): the only possible reading is one in which the modal has scope under negation:

(113) *Jean ne le doit$_{deon}$ pas toujours, m' aider.*
Jean NEG it must.PRES NEG always, me help
'*Jean is not always required to help me.*' (only reading)

NEG > ALWAYS > DEVOIR$_{deon}$; *DEVOIR$_{deon}$ > NEG > ALWAYS

By the criteria that we have used in this article, *devoir$_{deon}$* is thus a PPI. What is mysterious is why it can be interpreted under a clausemate negation: this is a very unusual behavior for a PPI. Using the theory developed in Homer 2010a, we can explain away this mystery if we stipulate that the smallest possible domain of *devoir$_{deon}$* doesn't contain negation (suppose that it is the VP that the modal heads). If this is so, when the licensing is checked on VP, the PPI is licensed (and doesn't need to 'escape'). But we have shown in Homer 2010a that licensing is liberal, so to speak: a PI need not be licensed on the first eligible constituent (going bottom-up) in which it is accept-

able. This means that when *devoir*$_{deon}$ is interpreted above a clausemate negation, its licensing has taken place in a larger constituent which encompasses negation (in this constituent escaping is necessary). I illustrate the two options with two different LFs below (for simplicity, I assume that *devoir*$_{deon}$ is anti-licensed by DEness; the label $\boxed{\text{YP}}\boxed{\nearrow x}$ used in the representation of logical forms indicates that YP is UE w.r.t. the position where the bearer of index *x* is interpreted; $\boxed{\text{YP}}\boxed{\nwarrow x}$ indicates that YP is DE w.r.t. the position where the bearer of index *x* is interpreted):

(114) Jean ne doit pas parler.

a. *Paraphrasable as:* Jean is not required to talk. (LF (115a))

b. *Paraphrasable as:* Jean mustn't talk. (LF (115b))

(115) a. $[_{\boxed{\text{TP}}\boxed{\nwarrow 1}}$ Jean$_2$ T $[_{\boxed{\text{XP}}\boxed{\nwarrow 1}}$ $[_{\boxed{\text{PolP}}\boxed{\nwarrow 1}}$ **pas** $[_{\boxed{\text{VP}}\boxed{\nearrow 1}}$ devoir$_{deon1}$ $[_{\text{TP}}$ t$_2$ parler]]]]]

b. $[_{\boxed{\text{TP}}\boxed{\nearrow 1}}$ Jean$_2$ T $[_{\boxed{\text{XP}}\boxed{\nearrow 1}}$ devoir$_{deon1}$ $[_{\text{PolP}}$ **pas** $[_{\text{VP}}$ t$_1$ $[_{\text{TP}}$ t$_2$ parler]]]]]

4.7.1.2 *Vouloir* and *want*

Armed with the hypothesis that certain PPIs can be interpreted under a clausemate negation, we can now turn to *vouloir* 'want' and its English counterpart. Some facts strongly suggest that it can take syntactic scope above negation. First, an *exactly*-numeral can be sandwiched between it and negation (in both languages), as shown by the non specific reading that obtains in (116):[22]

(116) *Context:* N. Sarkozy wants to cut public spending drastically: 60% of the civil servants who retire this year will not be replaced.

[22]The position of the negative marker *ne* is crucial: it indicates where negation is interpreted. When it precedes a verb, negation *pas*/*plus* is a clausemate of this verb. Therefore negation is interpreted in the matrix in (116).

Le président ne veut pas remplacer exactement 30 000 fonctionnaires.
the president NEG wants NEG replace exactly 30,000 civil servants
'The president doesn't want to replace exactly 30,000 civil servants.'

VOULOIR > EXACTLY_30000 > NEG

As we know, this reading cannot be achieved by the semantic route of a homogeneity presupposition, and is a test for (mobile) PPIs.

Second, *vouloir* can outscope the presupposition trigger *plus* 'anymore'. If we assume, as seems reasonable, that *plus* is a negation (which as such sits in the same position as *pas*) carrying the presupposition that the proposition denoted by the clause in its syntactic scope used to hold, its presupposition tells us what lies in its c-command domain. The following sentence is ambiguous, but its most natural reading is one in which it is not assumed that the speaker ever had a desire to be called an idiot (it also has the less natural reading whereby it is assumed that the speaker used to want to be considered an idiot):

(117) a. *Je ne veux plus qu' on me traite d' imbécile.*
I NEG want anymore that one me treats of idiot
'I no longer want to be called an idiot.' VOULOIR > PLUS

b. *Paraphrasable as:* I want it to be the case that I am no longer called an idiot.

Compare with another neg-raiser, *penser* 'think':

(118) a. *Je ne pense plus qu' on me traite d' imbécile.*
I NEG think anymore that one me treats of idiot
'I no longer think that I am called an idiot.' *PENSER > PLUS

b. *Not paraphrasable as:* I think that I am no longer called an idiot.

This time, the only possible reading is one in which it is assumed that the speaker used to think that he was called an idiot (ergo *plus* outscopes *penser*). Similarly in English:

(119) a. Consumers no longer want to be kept in the dark about food.

WANT > NO_LONGER

b. Consumers no longer think they're kept in the dark about food.

*THINK > NO_LONGER

The absence of *vouloir*/*want* from the presupposition of *plus*/*no longer* bears witness to its syntactic scope over negation: we can hypothesize that it is a mobile PPI which raises past negation when its licensing is checked on a constituent that contains negation, but its smallest possible domain doesn't encompass it (i.e. its licensing can be checked on VP). Neg-raising cannot explain that it is sometimes not part of the presupposition of *plus/no longer:* when an NRP achieves wide scope through homogeneity, it still lies in the syntactic scope of negation (p. 209). There is therefore some evidence that *vouloir* and *want* are mobile PPIs, whose smallest possible domain doesn't include negation (since they can always be interpreted with narrow scope under it).

If this is correct, do we have to jettison the analysis that we gave for *want* in 4.2? Did we misanalyze the wide scope of *want* over a clausemate negation as an effect of semantic neg-raising? No, wide scope through neg-raising is still an option open to *want;* but it is not the only one. In unembedded clauses, non-shielded *want* can achieve wide scope in two different ways: either through QR when its licensing is checked on a constituent at least as large as PolP, or through the semantic route of neg-raising. When it achieves wide scope over a superordinate negation (4.2.2), it is only through neg-raising (i.e. the semantic route); and when an existential wide scope reading obtains under *not every* (as in (10a) on p. 211), it is also only through neg-raising. Cyclicity and existential wide scope are unequivocal indicators that *want* is

indeed a neg-raiser.

However reaching a final verdict about the PPIhood of *want* is difficult, and I must defer to future research a complete exploration of its properties. What encourages me to exercise caution is the fact that the *no longer* test is not fully conclusive. In effect, under *no longer* (which, as seems reasonable, we can analyze as comprising sentential negation in the form of *no*) deontic *must* doesn't have to raise, and, judging from the data I have collected so far, cannot:

(120) You no longer must jog.

✓NO_LONGER>MUST$_{deon}$; *MUST$_{deon}$>NO_LONGER

This in turn suggests that *must* is shielded by *longer*, maybe by the presupposition it triggers (cf. Homer 2010d, Chapter 3 of this dissertation, on presuppositions as monotonicity-breakers). If this is so, the putative PPI *want* is expected to be shielded as well if the meaning relevant to its licensing incorporates the presupposition of *longer*, which means that it shouldn't be allowed to QR (because shielded mobile PPIs cannot raise, per the Principle of Laziness, cf. Homer 2010a, Chapter 2 of this dissertation). All these hypotheses need to be checked before adjudicating on the case of *want*.

4.7.2 Appendix II: Intermediate Scope or Split Scope?

Abels and Martí (2010) propose a unified analysis of the split scope readings that negative indefinites, comparative quantifiers and numerals give rise to across intensional verbs such as *must* and *can*. In this theory (inspired by Sauerland 1998, 2004), quantifiers are quantifiers over choice functions of type <<<et,e>,t>,t>; in split readings, they bind a choice function variable which the trace that they leave behind after movement; this trace combines with the noun phrase restriction in the scope of the

intensional verb. This way, the narrow scope reading of the indefinite in (121a) can be derived as a split scope reading involving a choice function. Importantly, the choice function has to be parameterized (so that the choice of ties varies from world to world; this amounts to Skolemization); to simplify our entries, the modal is treated as a universal quantifier over possible worlds and the modal base is specified by the accessibility relation Acc.

(121) a. You must wear a tie.

b. $[\![(121a)]\!]^{c,s} = 1$ iff $\exists f\ CF(f) \wedge \forall w' Acc(c_w)\ wear'(f(w',tie'))([\![you]\!]^{c,s})=1$ in w'

Recall that we used a quantifier over individuals with intermediate scope between *must* and negation to show that *must* is syntactically higher than negation when it is interpreted as having wide scope over it (52). With certain quantifiers, Abels and Martí's (2010) analysis in terms of choice functions can derive an intermediate scope reading without giving *must* syntactic scope over negation and without giving the quantifier over individuals intermediate syntactic scope between the modal and negation.

4.7.2.1 Split Scope with Simple Indefinites

Consider the case of a simple indefinite:

(122) *Context:* The rules of this bowling game state that exactly one pin must remain standing, no matter which one…

A pin mustn't be knocked down. ✓MUST>A>NEG

Suppose that a choice function variable combines with the restriction below the modal and below negation. *Must* takes semantic scope over negation; whether *must* is syn-

tactically higher than negation (as claimed in 4.3) or achieves wide scope through a homogeneity presupposition doesn't change the prediction. In both cases, the semantics of (122) will be as follows under the split scope analysis (which means that if this analysis is correct for the key sentence (52), p. 228, it deprives us of our argument in favor of the syntactic wide scope of *must*):

(123) $[\![(122)]\!]^{c,s}$ = ∃f [CF(f) ∧ ∀w'∈Acc(c_w) [¬ knock_down'(f(w',pin'))=1 in w']]

This is correct, as can be checked intuitively in Table 4.2: the first row describes the state of affairs across possible worlds; the next rows describe the choice functions and their outputs. I box the outputs of the CFs if they happen to be pins that are not knocked down in the worlds under consideration. And there happens to be a choice function, namely f_1, which in every possible world w' picks the pin that is not knocked down in w'. This means that the intermediate scope of a plain indefinite is not an argument in favor of the syntactic scope of *must* over negation: it is possible to achieve the reading through a homogeneity presupposition and a choice function variable bound across the modal.

	w_1	w_2	w_3	w_4	w_5	w_6
pins that stay up:	p_1	p_2	p_3	p_4	p_5	p_4
output of f_1:	$\boxed{p_1}$	$\boxed{p_2}$	$\boxed{p_3}$	$\boxed{p_4}$	$\boxed{p_5}$	$\boxed{p_4}$
output of f_2:	$\boxed{p_1}$	p_1	p_1	p_5	$\boxed{p_5}$	p_1
...						

Table 4.2: Simple Indefinite

4.7.2.2 No Split Scope with *Exactly*-numerals

Things are very different with *exactly*-numerals: their intermediate scope between *must* and negation is not amenable to the analysis in terms of split scope. Consider first a non negated sentence. Analyzing *exactly n* as 'at least n and no more than n', the choice function approach fails to derive the narrow scope reading of the *exactly*-numeral in a sentence like (124).

(124) Exactly one of those 6 people must come. ✓MUST > EXACTLY_ONE

The predicted truth-conditions are as follows:[23]

(125) $[\![(124)]\!]^{c,s} = \exists f\ [CF(f) \wedge dom(f)=\{p|\exists X \in p\ |X|=1\} \wedge$
$\forall p\ p \in dom(f) \rightarrow |f(p)| \geq 1 \wedge$
$\forall w' \in Acc(c_w)[come'(f(w',person'))=1 \text{ in } w']] \wedge$
$\neg\exists g\ [CF(g) \wedge dom(g)=\{p|\exists X \in p\ |X| > 1\} \wedge$
$\forall p\ p \in dom(g) \rightarrow |g(p)| > 1 \wedge$
$\forall w' \in Acc(c_w)[come'(g(w',person'))=1 \text{ in } w']]$

In the situation described in the first row of Table 4.3, the narrow scope reading of (124) is intuitively false: it is not the case that in every possible world w' exactly one person comes in w'. But the split scope reading given in (125) is true in that situation: there exists a function, e.g. f_1, which outputs individuals with at least one atom in them, such that in all possible world w' it picks a person that comes in w'; and there is

[23]The first restriction ('$dom(f)=\{p|\exists X \in p\ |X|=1\}$') says that in the domain of the choice function, all properties are such that you can find at least one member in them which has one atomic individual; the second restriction '$\forall p\ p \in dom(f) \rightarrow |f(p)| \geq 1$' says that all properties in the domain of the choice function are such that the output of the application of the choice function to the property has one or more atoms.

no function g which outputs individuals with more than one atom in them such that in every possible world w' g picks an individual that comes in w' (this is because in the worlds w_1 through w_5 exactly one individual comes: in those worlds in which exactly one person comes, the output of a function which selects plural individuals only cannot be in the extension of the property (λx. x come)).

	w_1	w_2	w_3	w_4	w_5	w_6
people that come:	p_1	p_2	p_3	p_4	p_5	p_1, p_2, p_3, p_4, p_5, p_6
output of f_1:	$\boxed{p_1}$	$\boxed{p_2}$	$\boxed{p_3}$	$\boxed{p_4}$	$\boxed{p_5}$	$\boxed{p_4}$
output of f_2:	$\boxed{p_1}$, p_2	p_1, $\boxed{p_2}$	p_1, $\boxed{p_3}$	p_1, $\boxed{p_4}$	p_1, $\boxed{p_5}$	$\boxed{p_1}$, $\boxed{p_2}$
...						

Table 4.3: 'Exactly One Must'

The problem carries over to the cases that interest us directly, i.e. intermediate scope of *exactly*-numerals in negative sentences.

(126) Exactly one pin mustn't be knocked down. ✓MUST > EXACTLY_ONE > NEG

Regardless of the source of the wide scope of the modal (QR or homogeneity presupposition), the truth-conditions under the split scope hypothesis are as follows:

(127) $[\![(126)]\!]^{c,s} = \exists f\ [CF(f) \wedge dom(f)=\{p|\exists X\in p\ |X|=1\} \wedge$
$\forall p\ p\in dom(f)\rightarrow|f(p)| \geq 1 \wedge$
$\forall w'\in Acc(c_w)[\neg\ knock\_down'(f(w',pin'))=1 \text{ in } w']] \wedge$
$\neg\exists g\ [CF(g) \wedge dom(g)=\{p|\exists X\in p\ |X| > 1\} \wedge$
$\forall p\ p\in dom(g)\rightarrow|g(p)| > 1 \wedge$
$\forall w'\in Acc(c_w)[\neg\ knock\_down'(g(w',pin'))=1 \text{ in } w']]$

In the situation described in the first row of Table 4.4, the intermediate reading of the numeral in (126) is intuitively false but the split scope reading given in (127) is true (this is because there is at least one world, namely w_1, in which the plural output of any function that only outputs plural individuals fails to stay up).

	w_1	w_2	w_3	w_4	w_5	w_6
pins that stay up:	p_1	p_2	p_3	p_4	p_5	p_1, p_2, p_3, p_4, p_5, p_6
output of f_1:	$\boxed{p_1}$	$\boxed{p_2}$	$\boxed{p_3}$	$\boxed{p_4}$	$\boxed{p_5}$	$\boxed{p_4}$
output of f_2:	$\boxed{p_1}$, p_2	p_1, $\boxed{p_2}$	p_1, $\boxed{p_3}$	p_1, $\boxed{p_4}$	p_1, $\boxed{p_5}$	$\boxed{p_1}$, $\boxed{p_2}$
...						

Table 4.4: 'Exactly One Mustn't'

Exactly-numerals are not amenable to the split scope analysis. It is possible to derive intermediate scope of a quantifier between a modal and negation as a reflection of split scope in concert with a homogeneity presupposition when the quantifier is a simple indefinite (4.7.2.1), but not when it is an *exactly*-numeral. As a result, it is crucial to use *exactly*-numerals in the 'pin' test: only then does the test show that the modal is syntactically higher than negation and is therefore a potential mobile PPI.

CHAPTER 5

Actuality Entailments and Aspectual Coercion

5.1 Introduction

A number of researchers, in particular Bhatt (1999) and (Hacquard 2006, 2009), have observed that in languages which distinguish the perfective and the imperfective aspects morphologically, whenever an ability or a circumstantial modal appears in the perfective in a positive matrix clause, it is possible to infer the truth of its complement in the actual world. I will only talk about one such language, namely French. Sentence (1a) features present perfect morphology; in the indicative mood, this morphology correlates with the perfective aspect. The sentence not only says that at a past interval Olga had the capacity to lift a fridge, it also entails that she did: it is infelicitous to contradict this inference, called an Actuality Entailment (henceforth AE), as in (1b), the continuation of the sentence:

(1) a. *Olga a pu$_{abil}$ soulever un frigo.*
Olga has can.PP lift a fridge
'Olga had the capacity to lift a fridge.'

b. *#Mais elle ne l' a pas fait.*
but she NEG it has NEG done
'But she didn't do so.'

In addition to the contradiction test, I propose a new test, which consists in enforcing the actuality of the complement in order to satisfy the presupposition triggered by

aussi ‘too’ in the continuation (presuppositions triggered by *aussi* are notoriously hard to accommodate):

(2) a. *Olga a pu$_{abil}$ soulever un frigo, et [Marie]$_F$ aussi en a soulevé un.*
Olga has can.PP lift a fridge and Marie too of-it has lifted one
‘Olga had the capacity to lift a fridge, and [Marie]$_F$ lifted one too.’

b. *Presupposition:* Someone other than Marie lifted a fridge.

The fact that the presupposition of *aussi* is satisfied by the inference triggered in the first conjunct is compatible with it being an entailment. We can easily eliminate another candidate, namely a scalar implicature (SI), by placing the first conjunct in a downward-entailing environment, which blocks SIs (while an entailment triggered in the antecedent of a conditional satisfies the presupposition of *aussi* triggered in the consequent (3b)).

(3) a. *Si Olga a pu$_{abil}$ soulever un frigo, [Marie]$_F$ aussi en a soulevé un.*
if Olga has can.PP lift a fridge Marie too of-it has lifted one
Presupposition: Someone other than Marie lifted a fridge.

b. If Olga lives in Paris, [Marie]$_F$ lives in France too.

Presupposition: Someone other than Marie lives in France.

Generalizing, AEs can occur with all root modals, including deontic ones (this fact is seldom acknowledged), as shown by (4):

(4) *#Avec l' autorisation de son nutritionniste, Olga a pu$_{deon}$ manger des*
with the authorization of her dietician Olga has can.PP eat of-the
pommes de terre, mais ne l' a pas fait.
potatoes but NEG it has NEG done

'Authorized by her dietician, Olga was allowed to eat potatoes, but she didn't do so.'

With the imperfective aspect (which correlates with simple past morphology, aka *imparfait*), AEs are not possible, as shown by the contradiction test (5a) and the presupposition test (5b) (the # sign in the latter indicates a presupposition failure):[1]

(5) a. *Olga pouvait$_{abil}$ soulever un frigo, mais ne l' a pas fait.*
Olga can.PST lift a fridge, but NEG it has NEG done

b. *#Si Olga pouvait$_{abil}$ soulever un frigo, [Marie]$_F$ aussi en a soulevé un.*
if Olga can.PST lift a fridge, Marie too of-it has lifted one

Under what conditions are AEs triggered? Previous researchers, especially Hacquard (2006), have proposed that AEs are triggered if and only if a root modal appears in the perfective (in a positive matrix clause). The main goal of this article is to show that this criterion is not warranted, for it is both too strong (AEs occur even when the predicate is not a modal) and too weak (the perfective doesn't suffice). Focusing for the time being on its excessive weakness, the standard criterion faces an immediate problem: AEs are not always mandatory under the perfective. It is possible, under certain conditions, to deny that the complement of the modal is true in the actual world,

[1]It is important to emphasize the contrast between (3a) and (5b): it shows the validity of the *aussi* test. One could in principle argue that (i.) *aussi* requires the presence of an antecedent in the discourse; (ii.) this antecedent must entail the presupposition triggered by *aussi;* (iii.) global accommodation can be appealed to to ensure that the entailment goes through. Suppose indeed that one accommodates: $\Diamond$ p $\rightarrow$ p: then the presupposition of the consequent is satisfied, and the test doesn't reveal the existence of an AE (i.e. the presence of a coercion operator, see below). It is the deviance of (5b) which shows that such a pragmatic line is not promising. I owe Philippe Schlenker (p.c.) this important comment.

as Mari and Martin (2009) were first to show (they propose an explanation to AEs which, like the one defended here, relies on a clash between the perfective and the stativity of root modals). Quantificational temporal modifiers, e.g. *une fois* 'once', *toujours* 'always', *souvent* 'often', *chaque fois* 'each time' (both in its restrictor and nuclear scope) are responsible for a subclass of exceptions to obligatory AEs. For example, the only difference between (6a) and (1) is the presence in the former of the modifier *à plusieurs reprises* 'on several occasions'. Locational temporal adverbials such as *cet après-midi* 'this afternoon' do not have the same effect (6b).

(6) a. À plusieurs reprises, Olga a pu$_{abil}$ soulever un frigo, mais ne l'a pas fait.

b. #Cet après-midi, Olga a pu$_{abil}$ soulever un frigo, mais ne l'a pas fait.

AEs should be impervious to temporal modification if the presence of a root modal under the perfective were a sufficient condition for them (assuming that aspect is preserved under temporal modification). Therefore examples like (6a) are genuine counterexamples to any theory that relies on the aforementioned criterion. Now, if the perfective is not sufficient, something else must come into play: I therefore submit that AEs result from some enrichment of the meaning of modalized sentences in the perfective. In order to capture the nature of the process, I propose that we look for a meaning-enrichment mechanism that applies specifically in the perfective. Aspectual coercion just fits the bill: it enriches the meaning of sentences where the perfective, in contravention of its need for a bounded predicate, is confronted with a stative one; this article shows that AEs are the result of a certain kind of aspectual coercion, which I name actualistic. Section 5.2 explains some key notions and argues that root modals form stative predicates. Section 5.3 shows how coercion applies uniformly to modal and non-modal predicates alike and presents AEs as instances of a hitherto undocumented kind of aspectual coercion, the actualistic one. Section 5.4 compares this

approach to Hacquard's (2006).

5.2 Background

5.2.1 Aspectual Classes

This article deals with the interaction between Viewpoint aspect and aspectual class, specifically between the perfective and stative predicates of eventualities. Predicates of eventualities (denoted by vPs) can be either bounded, stative or neither. I assume that the domain of eventualities D_v has a semi-lattice structure that is partially ordered by the part relation '$\sqsubseteq$': '$\sqsubseteq$': $\forall e,e' \in D_v$ [$e \sqsubseteq e' \leftrightarrow e \oplus e' = e'$]. The proper part relation is defined as follows: $\forall e,e' \in Dv$ [$e \sqsubset e' \leftrightarrow [e \sqsubseteq e' \wedge e \neq e']$]. Bounded predicates, e.g. *John bake the cake,* apply to eventualities that have no proper parts homogeneous to the whole (i.e. no proper part of an eventuality of John baking the cake is itself an eventuality of John baking the cake). Stative predicates, e.g. *John be in the pub,* apply to eventualities that have proper parts, each of which is homogenous to the whole. Let P be a predicate of eventualities:

(7) P is bounded iff $\forall e,e'$ if $P(e) \wedge e' \sqsubset e$ then $\neg P(e')$;
P is stative iff $\forall e$ if $P(e)$ then (i) $\exists e'[e' \sqsubset e]$ and (ii) $\forall e''$ if $e'' \sqsubset e$ then $P(e'')$.

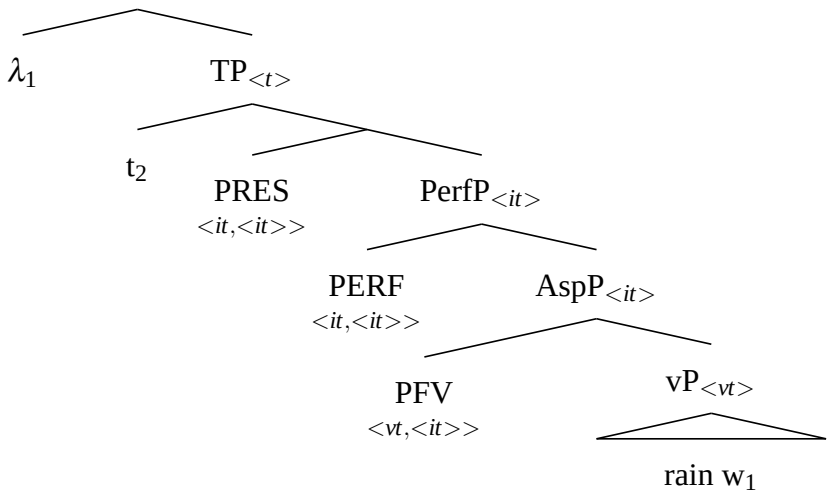
5.2.2 Viewpoint Aspect

I assume that Viewpoint aspect (either perfective, PFV, or imperfective, IMPFV) is a head located below T (and perfect, PERF, when it is projected as in the present perfect) and above vP. It takes a predicate of eventualities of type <vt> and a time interval (the topic time) of type <i> as arguments, and locates the temporal trace of some eventuality in the denotation of the predicate w.r.t. the topic interval. PFV

includes the runtime of an eventuality within the topic interval (the τ function maps eventualities onto their runtimes); the topic interval is introduced either by PERF (in perfect 'tenses') or directly by T (elsewhere).[2]

(8) a. Il a plu. (it has rained)

b.



(9) a. $[\![\text{PFV}]\!]^{c,s} = \lambda P_{vt}.\lambda t_i.\ \exists e_v[\tau(e) \subseteq t \wedge P(e)]$

b. $[\![\text{IMPFV}]\!]^{c,s} = \lambda P_{vt}.\lambda t_i.\ \exists e_v[t \subseteq \tau(e) \wedge P(e)]$

c. $[\![\text{PERF}]\!]^{c,s} = \lambda p_{it}.\lambda t_i.\ \exists t'_i[t' \leq t \wedge p(t')]$ ($t' \leq t$ iff there is no $t'' \subset t'$ s.t. $t'' > t$)

d. $[\![\text{PRES}]\!]^{c,s} = \lambda p_{it}.\lambda t_i.\ t = c_t \wedge p(t)$

e. LF: $[\lambda w_1\ [_{\text{TP}}\ t_2\ \text{PRES}\ [_{\text{PERFP}}\ \text{PERF}\ [_{\text{VAspP}}\ \text{PFV}\ [_{\text{vP}}\ w_1\ \text{pleuvoir}\ ]]]]]$

f. $[\![(9e)]\!]^{c,s}(c_w) = \exists t_i[t \leq c_t \wedge \exists e_v[\tau(e) \subseteq t \wedge e \text{ in } c_w \wedge \text{rain}(e)]]$

After de Swart (1998) and Bary (2009), I assume that a selectional restriction bears on the complement of PFV: it must be a bounded predicate of eventualities. The incompatibility of PFV with stative predicates is visible in the following:

[2]The lexical entries in (9a-d) are partially borrowed from Pancheva and von Stechow 2004; I use an extensional system with indexed abstractors over world variables which are syntactically represented, *à la* Percus 2000.

(10) a. *#Tout à l'heure, il a été assis/ en colère.*
earlier he has been sitting/ angry

b. *Tout à l'heure, il était assis/ en colère.*
earlier he was sitting/ angry

This is not to say that stative predicates can never co-occur with the perfective. In fact they can, but as we will now see, this co-occurrence is always accompanied by a certain semantic enrichment, called aspectual coercion (de Swart 1998, Bary 2009). In and of themselves, stative predicates are, by definition, unable to meet the selectional requirement of the perfective; but they can still occur under the perfective if they contribute to forming a bounded predicate.[3] Operative in the process are coercion operators inserted between PFV and vP, whose function is to return bounded predicates. Section 5.3 is devoted to the exploration of the properties of three coercion operators; my strategy is to show for each of them that it applies in a fully parallel fashion to non-modal and to modal predicates. Of central importance in the discussion is the third operator, the one which gives rise to the entailment that an event related to the core stative predicate took place in the actual world.

5.2.3 Modals Form Stative Predicates of Eventualities

Before proceeding, it is important to show that root modals form (i.) predicates of eventualities (ii.) which are stative (the ultimate goal is to show that the enrichment process that targets statives in the perfective applies to them too). First, Viewpoint aspect selects for a predicate of eventualities P of type <v,t> (cf. (9a)). It seems safe to assume that in the sentences that interest us, the root modal is the head of the complement of VAsp and as such it forms a predicate of eventualities. Second, what kind of eventuality gets ordered w.r.t. the topic interval in the presence of a root

[3]Activities e.g. *John run*, are neither bounded nor stative; they can appear under the perfective through some coercion (interestingly, their coercion doesn't seem to ever need any temporal adverbials).

modal? My claim is that root modals apply to states (the evaluation points of their accessibility relations), which are the input to the temporal ordering carried out by Viewpoint aspect. This claim is somewhat unusual, so we need to look at the facts with great care. If it is true that root modals apply to eventualities, these should have time and space coordinates, like any other eventuality. As for a time coordinate, in sentence (11) the adjunct *hier* 'yesterday' sets the time of Pierre's obligation to turn in his homework, while *la semaine prochaine* 'next week' sets the time of the turning-in itself.

(11) *Context:* The rules have just changed: Pierre now has to turn in his homework tomorrow.

Hier encore, il devait$_{deon}$ *rendre son devoir la semaine*
yesterday still he must.PST turn-in his homework the week
prochaine.
next
'Yesterday, he still had to turn in his homework next week.'

Therefore what Viewpoint aspect (IMPFV in the case at hand) orders w.r.t. the topic interval is the runtime of a legal situation (now over and superseded by a new one); it is not the runtime of an event of Pierre turning in his homework. Generalizing, eventualities in the denotation of the complement of a root modal are never quantified over by Viewpoint aspect.

The next sentence exemplifies a mismatch between the space coordinate of the legal situation fixed by the matrix adverbial, and the one of the eventuality of graduating.

(12) *Context:* Where he lives now, is Jean allowed to practice as a surgeon with his French degree?

Non, dans ce pays Jean ne peut$_{deon}$ *pas avoir obtenu son diplôme de*
no in this country Jean NEG can.PRS NEG have gotten his degree of
chirurgien à l'étranger.
surgeon abroad

'No, in this country, Jean is not allowed to have gotten his surgeon degree abroad.'

Predicates formed by root modals thus apply to eventualities. I propose that root modals take as arguments a proposition (they create biclausal structures), a world and an eventuality (the same lexical entry holds, mutatis mutandis, for *devoir*$_{root}$ 'must'). The accessibility relation Acc takes as input an eventuality, e.g. the existence of certain conditions, rules or circumstances (I draw on situation semantics when I say that accessibility is not relative to a world but to an eventuality).

(13) a. $[\![\text{pouvoir}_{root}]\!]^{c,s} = \lambda\Phi_{st}.\lambda w_s.\lambda e_v.\ e \text{ in } w \wedge \exists w'_s \in \text{Acc}(e)[\Phi(w')]$

b. Jean peut$_{deon}$ travailler.

c. $[\![(13b)]\!]^{c,s} = 1$ iff at c_t there is an eventuality e in c_w such that for some world w' compatible with e, Jean works in w'.

If root modals are predicates of eventualities, they are stative, since our definition of stative predicates applies to them: any P eventuality described as the existence of certain conditions, rules or circumstances, has proper parts, each of which is itself a P eventuality. There is empirical evidence that root modals do form stative predicates: I use the incompatibility of the periphrastic progressive *être en train de* 'be in the process of' with stative predicates illustrated in (14b) as a test. As expected, the modal predicate *x pouvoir gagner l'élection* 'x can win the election' is infelicitous under the progressive:

(14) a. *être en train de gagner l' élection/ courir*
be in process of win.INF the election run.INF

b. *#être en train d' être en colère/ pouvoir gagner l' élection*
be in process of be.INF angry can.INF win the election

Furthermore, in counterfactuals, root modals behave like well-established statives and unlike well-established eventives.

(15) a. *S' il était plus grand, il jouerait en ce moment au basket au niveau professionnel.*
if he be.PST more tall he play.COND in this moment at-the basketball at-the level professional
'If he were taller, he would be playing as a professional basketball player.'

b. *S' il pouvait marquer des paniers comme M. Jordan, il jouerait en ce moment au basket au niveau professionnel.*
if he can.PST score of-the baskets like M. Jordan he play.COND in this moment at-the basketball at-the level professional

'If he could score points like M. Jordan, he would be playing as a professional basketball player.'

c. *#S' il rencontrait M. Jordan, il jouerait en ce moment au basket au niveau professionnel.*
if he met M. Jordan he play.COND in this moment at-the basketball at-the level professional

'If he met M. Jordan, he would be playing as a professional basketball player.'

5.3 Aspectual Coercion

5.3.1 Ingressive Interpretation

Uttered out of the blue, (16a) is deviant for want of a bounded predicate satisfying the requirement of the perfective. The adjunction of the adverb *soudain* 'suddenly' in (16c) salvages the sentence:

(16) a. #*Jean a été en colère cet après-midi.*
Jean has be.PP angry this afternoon

b. *Jean était en colère cet après-midi.*
Jean be.PST angry this afternoon

c. *Jean a soudain été en colère cet après-midi. Il n' a pas cessé de l' être depuis.*
Jean has suddenly been angry this afternoon he NEG has NEG stopped of it be since-then

'Suddenly, Jean became angry this afternoon. He has been angry non-stop ever since.'

Given the background assumptions adopted here, this means that a bounded predicate is made available in (16c) and is fed to PFV. A coercion operator generated between PFV and vP must be responsible for the transformation, and the adverb plays a role in licensing the operator.[4] We can infer the workings of this operator from the particular reading that obtains: the sentence says that Jean started being angry at a time included within the topic interval denoted by this afternoon (and leaves open the possibility that Jean is still in this state at the time of utterance). To achieve this reading, Bary (2009) postulates an INGR operator, which outputs, in the case at hand, a bounded predicate of eventualities (the input to PFV) that applies to instantaneous—hence devoid of proper parts—eventualities, the initial bounds of open-ended eventualities of Jean being angry. I refer the reader to Bary 2009 for details. Now, the very same kind of reading comes about with modal predicates:

(17) a. Olga a soudain pu$_{abil}$ soulever un frigo, mais ne l'a pas fait.

b. Si Olga a soudain pu$_{abil}$ soulever un frigo, [Marie]$_F$ aussi en a soulevé

[4]The exact role of adverbials in supporting certain readings is not explored in this article. They don't seem to be necessary to carry out the ingressive and the complexive coercions, because certain predicates can be coerced in the perfective without temporal modification, e.g. *Pierre être prof d'anglais* 'Pierre be an English teacher', which can easily be understood as a locally maximal state (i.e. complexive interpretation).

un.

Olga a soudain pu soulever un frigo can mean, as the continuation in (17a) shows, that a state of Olga being able to lift a fridge came into existence at some point: under this reading brought about by INGR (and made available e.g. in a context where a magician played a trick on Olga that made her strong instantly), the AE is not triggered. But under another reading, the AE comes about (17b). As will become clearer in section 5.3.4, the optionality of the AE in (17) is a case of ambiguity between two kinds of coercion, the ingressive one (17a) and the actualistic one (which yields AEs) (17b). A point needs to be emphasized: a modal predicate can be coerced, in the same way that a non-modal stative predicate can. From this it follows that modal predicates do not meet the selectional requirement of the perfective and that they in fact must be coerced to fit under this particular Viewpoint aspect.

5.3.2 Complexive Interpretation

The second kind of special interpretation that arises when the perfective is confronted with a stative predicate is what Bary (2009) calls a complexive interpretation, whereby the existence of a locally maximal state is asserted. Quantificational adverbials e.g. *à plusieurs reprises* 'on several occasions', *une fois* 'once', *chaque fois* 'each time', *à un moment* 'at some point'..., as well as durational ones e.g. *pendant n heures* 'for n hours'... (as opposed to locational ones, e.g. *cet après-midi* 'this afternoon') support this reading.

(18) *Il y a un moment de l' après-midi où Jean a été assis.*
there is a moment of the afternoon where Jean has been sitting

For (18) to be true, this afternoon must contain a maximal state of Jean sitting (i.e. a state not contained within some larger state of the same nature). After Bary (2009), I assume that an operator labeled MAX (generated between PFV and vP) performs the operation of turning a stative predicate into a maximal one. In the case at hand, boundedness is achieved through maximality: no proper part of a maximal P eventuality is itself a maximal P eventuality (see Bary 2009 for details). Here again, it is important to observe that modal predicates pattern with non-modal ones in being subject to the same kind of coercion. (19a) merely says that at some point in the past, there was a temporally maximal capacity:

(19) a. Il y a un moment où/À plusieurs reprises Olga a pu$_{abil}$ soulever un frigo, mais ne l'a pas fait.

b. S'il y a un moment où/Si à plusieurs reprises Olga a pu$_{abil}$ soulever un frigo, [Marie]$_F$ aussi en a soulevé un.

The two continuations show again an ambiguity, this time between a complexive reading (19a) and an actualistic one (aka AE) (19b). The fact that modal predicates are amenable to at least two kinds of aspectual coercion in the perfective suffices to show that they are not suitable under the perfective, and that they need to be coerced. It is now time (i.) to show that there exists a kind of coercion which gives rise to AEs with non-modal stative predicates and (ii.) to propose that canonical AEs (with modals) are nothing but the result of this coercion.

5.3.3 Actualistic Interpretation

Besides the ingressive and the complexive interpretations, French has a third kind of aspectual coercion of stative predicates, which has gone unnoticed so far. I propose that it is the culprit in the triggering of canonical AEs. When placed in the scope of PFV,

a number of stative predicates (importantly, not all predicates are eligible) give rise to a reading whereby the existence of some pragmatically determined event is entailed. This is true e.g. of predicates formed with the verb *coûter* 'cost': (20a) not only says what the price of the house was, it also entails that the house was bought for that price. No such entailment occurs if we substitute the *imparfait* (hence imperfective aspect) for the present perfect (which correlates with the perfective aspect), as in (20b):

(20) a. *La maison a coûté 100 000 €.*
the house has cost.PP €100,000
→ The house was bought.

b. *La maison coûtait 100 000 €.*
the house cost.PST €100,000
$\not\rightarrow$ The house was bought.

Similarly with the following stative predicates; the entailment only obtains in the perfective:

(21) a. *L' obstacle a été facile/ difficile/ presque impossible à franchir.*
the obstacle has be.PP easy/ difficult/ almost impossible to overcome
→ The obstacle was overcome.

b. *L' obstacle était facile/ difficile/ presque impossible à franchir.*
the obstacle be.PST easy/ difficult/ almost impossible to overcome
$\not\rightarrow$ The obstacle was overcome.

(22) a. *Jean a eu du tact.*
Jean has have.PP of-the tact
→ Jean acted tactfully.

b. *Jean avait du tact.*
Jean have.PST of-the tact
$\not\rightarrow$ Jean acted tactfully.

(23) a. *Jean a été intelligent.*
Jean has be.PP intelligent

$\rightarrow$ Jean did something intelligent.

b. *Jean était intelligent.*
Jean be.PST intelligent
$\not\rightarrow$ Jean did something intelligent.

The fact that these entailments only occur in the perfective strongly suggests that they result from aspectual coercion. I call the operator at play ACT.

(24) a. $[\![\text{ACT}]\!]^{c,s} = \lambda P_{vt}.\lambda Q_{vt}.\lambda w_s.\lambda e_v.\ Q(e) \wedge e \text{ in } w \wedge \forall e'_v[e' \sqsubset e \rightarrow \neg Q(e')] \wedge \exists e''_v[P(e'') \wedge \tau(e)=\tau(e'')]$

b. Jane a pu_{circ} prendre le train.

c. LF of (24b): $[\lambda w_1\ [_{TP}\ t_4\ \text{PRES}\ [_{PERFP}\ \text{PERF}\ [_{VAspP}\ \text{PFV}\ [\ w_1\ Q_2\ \text{ACT}\ [_{vP}\ w_1\ \text{pouvoir}\ [_{CP}\ \lambda w_3\ [\ w_3\ \text{J. prendre-le-train}]]]]]]]]$

d. $[\![(24c)]\!]^{c,s}(c_w) = 1$ iff there is a past interval t s.t. there is an eventuality e of $s(Q_2)$ in t in c_w s.t. no proper part of e is an eventuality of $s(Q_2)$, and e is simultaneous with a state in c_w of J. taking the train being possible.

The bounded predicate of eventualities ACT returns is pragmatically determined; for example in (20a), the output predicate applies to events of someone buying the house and in (24b) to events of Jane taking the train (the value of $s(Q_2)$ above). This means that the second predicate argument of ACT is, in the object language, a free variable, whose value is set by the context. The third conjunct in the meaning of ACT says that it is bounded. The fourth conjunct ensures that the runtime of the event is simultaneous with the runtime of some eventuality in the denotation of the core stative predicate. That the latter simultaneity condition exists is evidenced by the infelicity of (25b) and (26b):

(25) *Context:* A yachtsman talks about a round-the-world non-stop race in which

he took part several times, and in which he is currently engaged…

a. *La dernière fois, la ligne d'arrivée a été difficile à atteindre.*
the last time the finish line has be.PP difficult to reach
Intended: *'Last time, the finish line was hard to reach.'*

→ The finish line was reached.

b. *#Hier la ligne d'arrivée a été difficile à atteindre demain.*
yesterday the finish line has be.PP difficult to reach tomorrow
Intended: *'Yesterday, the finish line was hard to reach tomorrow.'*

(26) a. *Hier Pierre a pu rendre son devoir.*
yesterday Pierre has can.PP turn-in his homework
'Yesterday, Pierre was able to turn in his homework.'

→ Pierre turned in his homework yesterday.

b. *#Hier Pierre a pu rendre son devoir demain.*
yesterday Pierre has can.PP turn-in his homework tomorrow
Intended: *'Yesterday, Pierre was able to turn in his homework tomorrow.'*

Lastly, I would like to add to this discussion a fact that illuminates the workings of ACT. We have shown that *x coûter y* 'x cost y' can easily give rise to an actualistic interpretation ((20a) repeated below). Its near synonym *x valoir y* 'x be worth y' cannot:

(27) a. *La maison a coûté 100 000 €.*
the house has cost.PP €100,000
→ The house was bought.

b. *#La maison a valu 100 000 €.*
the house has be-worth.PP €100,000

There is a crucial difference in the lexical semantics of *cost* and *be worth.* The *value* of an object is independent of a monetary transaction: even without being for sale, or after being sold, an object can retain its value, but not its price. Only objects that are up for sale have a price, and lose it once they have been purchased. This difference

rooted in the lexical entry of the two verbs suffices, I hypothesize, to fix the value of the predicate variable argument of ACT (namely an event of buying the house in (27a)): besides commonplace assumptions and encyclopedic knowledge (in the case e.g. of *be intelligent*), the very meaning of words that make up the complement of PFV is exploited to give a plausible value to the free variable (namely the meaning of *cost* in (27a)).

In brief, the effect of ACT matches the description of AEs. Given that modal predicates are in fact always coerced in the perfective, I propose that AEs with root modals in (1), (3a), (6b), (17b) and (19b) are mere instances of the actualistic coercion.

5.3.4 Ambiguity

All stative predicates need to be coerced in the perfective. Temporal adverbials support certain types of coercion (as summarized in Table 5.1). For the predicates that are amenable to the actualistic one, temporal modifiers are not necessary to get the interpretation: therefore in the presence of temporal modifiers, ambiguity ensues, and in their absence, only the actualistic interpretation is available. As for predicates that are not amenable to the actualistic interpretation, the only way they can be made acceptable in the perfective is through the ingressive and the complexive interpretations, supported by the appropriate modifiers (they are otherwise generally excluded cf. (10a) on page 271).

We have seen a case (19) (repeated here for convenience) where two types of coercion (complexive and actualistic) are possible in the presence of a quantificational modifier.

(28) a. Il y a un moment où/À plusieurs reprises Olga a pu$_{abil}$ soulever un frigo, mais ne l'a pas fait. *(Compl^{ve})*

Predicates↓ / Modification→	No modifier	'Soudain'	Quantificational Modifiers
John be angry, *John be sitting*	No Coercion	Ingr^{ve} (no AE)	Compl^{ve} (no AE)
John can p, John must p, *the house cost n,* *m be difficult to p*	Act^{ic} (AE)	Ingr^{ve} (no AE) or Act^{ic} (AE)	Compl^{ve} (no AE) or Act^{ic} (AE)

Table 5.1: Stative Predicates and their Coercion Potentials

b. S'il y a un moment où/Si à plusieurs reprises Olga a pu$_{abil}$ soulever un frigo, [Marie]$_F$ aussi en a soulevé un. *(Act^{ic})*

A hallmark of the actualistic coercion is the simultaneity between the pragmatically salient event and a state in the denotation of the core stative predicate. We can now provide further evidence that (28b) is an instance of the actualistic interpretation: by violating the simultaneity condition, we make the continuation which contains the anaphoric presupposition trigger *aussi* 'too' infelicitous in (29) (in the absence of a temporal mismatch, the continuation is impeccable (28b)). This confirms that our analysis of AEs as stemming from the actualistic coercion is on the right track, and that quantificational temporal modifiers do not block AEs, they simply make them optional.

(29) *Il y a un moment où Olga a pu soulever un frigo lors de la*
there is a moment where Olga has can.PP lift a fridge during the
foire qui a lieu demain. #[Marie]$_F$ aussi a soulevé un frigo.
fair that takes place tomorrow Marie also has lifted a fridge

Intended: *'At some point, Olga was able to lift a fridge during tomorrow's fair. [Marie]$_F$ also lifted a fridge.'*

I would like to close this section by showing that the coercion operators that I posited

are indeed present in the syntax (the demonstration is about MAX and ACT). To do so, I use a gapping test. First of all, I show that MAX is syntactically represented when a complexive interpretation obtains.

(30) *Context:* A group of ten French people are being held hostage by rebels in the Amazon rainforest. Some of them have developed Stockholm syndrome, i.e. they prefer to stay with their captors; every hostage that ever managed to escape and got caught was immediately killed…

a. *Jean a pu s' évader chaque fois qu' il était seul avec son*
Jean has can.PP REFL escape each time that he was alone with his
gardien et Marie, mardi matin. #[Pierre]$_F$ aussi s' est
guard and Marie Tuesday morning Pierre also REFL is
évadé mardi.
escaped Tuesday

Intended: '*Jean had an opportunity to escape each time he was alone with his guard, and Marie, on Tuesday morning. [Pierre]$_F$ also escaped on Tuesday.*'

b. *Jean a pu s' évader chaque fois qu' il était seul avec son*
Jean has can.PP REFL escape each time that he was alone with his
gardien et Marie a pu s' évader mardi matin. [Pierre]$_F$
guard and Marie has can.PP REFL escape Tuesday morning Pierre
aussi s' est évadé mardi.
also REFL is escaped Tuesday

'*Jean had an opportunity to escape each time he was alone with his guard, and Marie had an opportunity to escape on Tuesday morning. [Pierre]$_F$ also escaped on Tuesday.*'

The first conjunct of the first sentence of (30a) favors a complexive interpretation (since no prisoner escaped more than once) which the temporal modifier makes possible; the constituent that is gapped in the second conjunct is identical with some constituent of the first conjunct which is at least as large as VAspP. Importantly, there is no quantificational temporal modifier in the second conjunct, but a complexive interpretation obtains nonetheless: it is forced by syntactic means (i.e. copying). The continuation

with *aussi* ‘too’ yields a presupposition failure: the AE is unavailable. The gapped constituent contains MAX—instead of ACT—because its antecedent does too. We have evidence that the complexive interpretation—i.e. MAX insertion—obtains through at least two routes: either MAX is licensed by certain quantificational temporal modifiers, or it is copied from another clause. In (30b), which is a control and where no copying takes place, the AE in the second conjunct is possible (the *aussi*-test is successful) and in fact necessary (in the absence of modification or copying).

We can apply the same strategy to show that ACT is syntactically represented when an actualistic interpretation obtains.

(31) *Context:* Same as in (30)...

a. #*Jean a enfin pu s’ évader mardi matin, et Marie,*
Jean has finally can.PP REFL escape Tuesday morning and Marie
chaque fois qu’ elle était seule avec son gardien.
each time that she was alone with her guard

‘Jean was finally able to escape on Tuesday morning, and Marie, each time she was alone with her guard.’

b. *Jean a enfin pu s’ évader mardi matin et Marie a*
Jean has finally can.PP REFL escape Tuesday morning and Marie has
pu s’ évader chaque fois qu’ elle était seule avec son gardien.
can.PP REFL escape each time that she was alone with her guard

‘Jean was finally able to escape on Tuesday morning, and Marie was able to escape each time she was alone with her guard.’

The first conjunct of (31a) has an actualistic interpretation (i.e. an AE) because it lacks a quantificational temporal modifier. Copying of VAspP—including the ACT operator it contains—into the second conjunct ruins the coherence of the discourse (in the context, no prisoner ever escaped more than once) but it is syntactically forced, hence the incoherence marked with the # sign. In the control sentence (31b), the first conjunct

receives an actualistic interpretation and the second conjunct a complexive interpretation, and no incoherence ensues (the asymmetry is possible because no copying is involved).

To sum up, we have shown that AEs are instances of a kind of aspectual coercion which targets modal and non-modal predicates alike (the actualistic coercion). We have shown that syntactically represented coercion operators are operative in satisfying the need of the perfective to combine with a bounded predicate of eventualities.

5.4 Comparison with Hacquard 2006

Hacquard (2006) focuses on examples with ability and circumstantial modals (primarily existential), without any adverbial modifiers. She thus doesn't discuss any exceptions to AEs, such as (6a), (17a) and (19a). But these exceptions are genuine counterexamples to her analysis. The thrust of the proposal lies in what Hacquard takes to be a syntactic peculiarity of modal verbs: *pouvoir* and *devoir*, unlike other modal expressions e.g. *avoir la possibilité de*, are, according to this proposal, auxiliaries. When it comes to AEs, this purported difference is prima facie illuminating: in the absence of temporal modifiers, negating the actuality of the complement of the former leads to a contradiction, as we already know, cf. (1) on p. 265; but the same test applies to the latter without a hitch:

(32) Olga a eu la possibilité$_{circ}$ de prendre le train de 7 heures, mais ne l'a pas fait.
'Olga had the possibility to take the 7 o'clock train but she didn't do so.'

Hacquard concludes that modal verbs are special among modal expressions, and among verbs tout court: they are auxiliaries (in ModP), and as such lack an argument that, in her account, all lexical verbs have, namely Viewpoint Aspect. Here the proposal de-

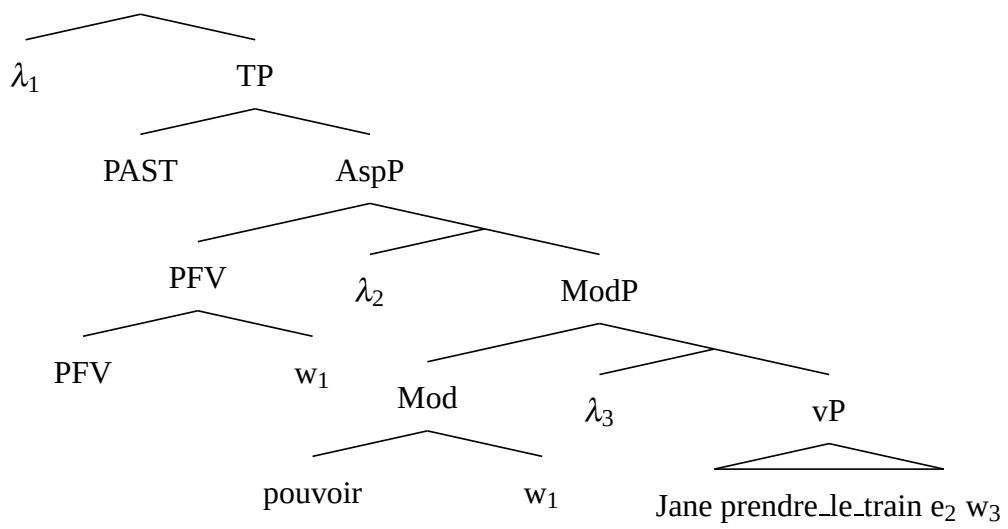
parts from the orthodox view (held here and in many studies on tense and aspect) that Viewpoint Aspect is a projection intermediate between Tense and vP: Viewpoint Aspect in Hacquard's view is generated as an argument (of type <<s,i,vt>,t>) of lexical verbs, but a type mismatch forces it to raise right below Tense, leaving behind a trace <v>. When a root modal verb (a quantifier over accessible worlds) is present, the raised Viewpoint Aspect argument ends up taking scope over it. Next, Viewpoint Aspect is a generalized quantifier over eventualities; as a result of moving out of its base position, it binds its trace of type <v> in the nuclear scope of the modal (this amounts to quantifying in); it also takes a world argument bound by the matrix default world binder λw_1.[5]

(33) a. $[\![\text{PFV}]\!]^{c,s} = \lambda w_s.\lambda t_i.\lambda P_{vt}.\ \exists e_v[e \text{ in } w \wedge \tau(e) \subseteq t \wedge P(e)]$

b. $[\![\text{pouvoir}_{root}]\!]^{c,s} = \lambda w_s.\lambda \Phi_{st}.\ \exists w'_s \in Acc(w)[\Phi(w')]$

c. Jane a pu$_{circ}$ prendre le train.

(34)



[5]Another difference with my proposal lies in the treatment of tense: Hacquard assimilates *passé composé* with past, which, in her view, is a pronoun which presupposes anteriority w.r.t. the time of the context (curly brackets in (35b) indicate a presupposition.)

(35) a. LF of (33c): $[\lambda w_1\ [_{TP}$ PAST [PFV w_1] [2 $[_{ModP}$ [pouvoir w_1] $\lambda w_3\ [_{vP}\ w_3$ Jane prendre-le-train t_{2v}]]]]]

b. $[\![(35a)]\!]^{c,s}(c_w) = \exists e_v[e \text{ in } c_w \wedge \tau(e) \subseteq t\ \{t < c_t\} \wedge$

$\exists w'_s \in Acc(c_w)[\text{take-the-train}(w', e) \wedge Ag(e, J)]]$

'There is an event in c_w located in a past interval, and there is a world compatible with Jane's abilities in c_w where that event is a taking-the-train event by Jane.'

In this configuration, Viewpoint Aspect asserts the existence of some eventuality in the actual world, and with an existential quantification over possible worlds mediating between Viewpoint Aspect and vP (i.e. the modal), this eventuality is said to be, in some accessible world, in the denotation of the predicate denoted by vP.[6] Hacquard claims that the properties of an eventuality e in an accessible world are the same as the properties of e in the actual world, which derives that in (33c) an eventuality of Jane taking the train took place in actuality.

(36) **Principle of Event Identification across Worlds (Hacquard 2006):**[7] For any w_1, w_2: If an eventuality e occurs in w_1 and w_2, and e is described as a P eventuality in w_1, then e is a P eventuality in w_2.

[6]As it stands, the proposal doesn't predict that AEs do not arise when the morphology on the modal verb is imperfective: Hacquard needs to stipulate that the imperfective has no semantics of its own, and that it is a mere morphological spell-out that occurs when Tense and Viewpoint Aspect are not adjacent: this morphology is realized when there is a silent intensional operator above the landing site of the Aspect argument and below Tense: according to her, the effect of this intensional operator, e.g. GEN, is that the entailment holds of some accessible world rather than of the actual world. See Portner 2009 for a discussion of this point.

[7]For our current purposes, it is sufficient to quote, as I do, a provisional version of the principle, glossing over the final version. In either version, the principle rests on the questionable assumption that an event necessarily keeps the same properties across worlds, which seems implausible in view of the existence of counterfactuals, as noted by Hacquard herself (Hacquard 2009). Since the facts that I'm presenting here are by and large foreign to this aspect of Hacquard's theory, I will leave this discussion here.

I now point out three shortcomings of this account. First, there is no compelling reason to treat French root modal verbs as auxiliaries. As a matter of fact, Hacquard does not define the notion of auxiliary, and after all it is not even clear that it corresponds to any natural class. It is commonly thought that English so-called true modals (e.g. *must* and *can*) are auxiliaries by virtue of their participation to V-to-T movement (evidenced by the linearization of *not* after them). In French tensed clauses, this property is shared by all verbs, and cannot be used as a criterion; in infinitive clauses, where Pollock (1989) shows that V-to-T discriminates among verbs, head movement of root modals is very marginal (37a), unlike that of the auxiliaries *être* 'be' and *avoir* 'have' (37b), suggesting that the former are not auxiliaries.

(37) a. ??*ne pouvoir pas parler/ ne devoir pas parler*
NEG can.INF NEG speak/ NEG must.INF NEG speak

b. *n' avoir pas parlé*
NEG have.INF NEG spoken

c. **ne parler pas*
NEG speak.INF NEG

Second, we have seen that root modals are unlikely to be mere quantifiers over possible worlds without an eventuality argument, pace Hacquard (compare (13a) on p. 273 and (33b) on p. 286). In subsection 5.2.3, I proposed that root modals, as predicates of eventualities, apply to states located in space and time (the evaluation points of root accessibility relations). Now if this claim is correct, the quantifying-in approach loses its bite: in sentences with a root modal, Viewpoint Aspect really quantifies over eventualities that the modal or the output of a coercion operator (in the perfective), applies to; it doesn't quantify over eventualities in the set denoted by the vP in the scope of the modal. In other words, Viewpoint Aspect always selects for a complement of type <vt> and quantifies over eventualities in its denotation, which it locates w.r.t.

the topic interval. If quantifying-in were taking place, Viewpoint Aspect would locate w.r.t. the topic interval eventualities occurring in the worlds quantified-over by the modal; yet this cannot be true, for the temporal location of those eventualities is set independently of matrix Viewpoint Aspect, cf. (11) on 272.

Third, the claim that AEs only occur with root modal verbs (the so-called auxiliaries) is falsified twice.

1. It is not the case that periphrastic modal expressions are unable to trigger AEs in the perfective. Granted, (32) shows that a contradicting continuation can be used with *avoir la possibilité de,* without creating any semantic deviance. Yet it is imprudent to conclude from this that no sentence pronounced *Olga a eu la possibilité de prendre le train de 7 heures* triggers an AE. Such a string is in fact ambiguous: under one reading, it does not yield an AE (32), but under another one, it does, as illustrated in (38), where the perfectly felicitous use of the presupposition trigger *aussi* 'too' reveals that it is part of the common ground when the continuation is uttered that Olga did take the 7 o'clock train.

(38) Si Olga a eu/#avait la possibilité$_{circ}$ de prendre le train de 7 heures, [Marie]$_F$ aussi l'a pris.
'If Olga had the possibility to take the 7 o'clock train, [Marie]$_F$ took it too.'

In light of the principles I advocate in this article, the reason no AE is triggered in (32) is either that no aspectual coercion occurs, or that a kind of coercion other than the actualistic one is available (without adverbial modification). The first option is certainly viable, since the verb *avoir* 'have', which is part of the modal expression, has some eventive usages, e.g. in (39), where it means *get* in the absence of any aspectual coercion (the sentence is in the simple indicative present).

(39) *On a son bac à 18 ans.*
one have.PRS his A-levels at 18 years
'One gets their A-levels at the age of 18.'

2. AEs are not in fact restricted to modal expressions *sensu lato,* as became apparent in section 5.3.3. Hacquard acknowledges the existence of an actuality inference in (20a) p. 278, cf. her example (9a); but she claims that this inference is the result of a pragmatic reasoning which goes as follows: the sentence says that there was a past interval at which the cost of the house was €100,000. The hearer reasons that if this state is now over, it is because some event put an end to it, and the most plausible event capable of terminating such a state is a monetary transaction. Notice that this account makes no reference to the perfective, only to the fact that the state is at the time of utterance (i.) past and (ii.) completed. But these two characteristics do not suffice to yield the transaction inference: we can very well concoct an imperfective sentence and ensure that the denoted state features the two characteristics, yet the inference does not obtain:

(40) *La maison coûtait 100 000€ jusqu'en 1980 mais pas au delà.*
the house cost.PST €100,000 until 1980 but not beyond
$\not\rightarrow$ The house was bought.

In closing, I would like to emphasize the importance of the 'exceptions' (6a), (17a) and (19a). One cannot rescue Hacquard's theory by claiming that temporal modifiers change Viewpoint Aspect from perfective into imperfective (this attempt is made in Hacquard 2006, fn. 73 on p. 164 about *sempre* 'always' in Italian). There is no evidence that temporal modifiers have this effect. In fact there is ample evidence to the contrary: in all those sentences, there is a temporal inclusion *within* a topic interval, in accordance with the semantics of PFV. By themselves, temporal modifiers never change Viewpoint Aspect: this is evident in non-modalized perfective sentences, which

have none of the characteristic aspectual properties of their imperfective counterpart. For example it is well known that accomplishments in the imperfective give rise to the so-called imperfective paradox (i.e. the lack of entailment illustrated in (41a)):

(41) *Context:* At that moment…

a. *Jean traversait la route.*
Jean cross.PST the road
'*Jean was crossing the road.*'

$\not\rightarrow$ Jean crossed the road.

b. Possible continuation:
Il n'est jamais arrivé de l'autre côté.
'*He never made it to the other side.*'

The entailment that Jean crossed the road does hold in the perfective, even with a quantificational modifier:

(42) a. *À un moment donné, Jean a traversé la route.*
at a moment given Jean has cross.PP the road
'*At some point, Jean crossed the road.*'

$\rightarrow$ Jean crossed the road.

b. Impossible continuation:
#Il n'est jamais arrivé de l'autre côté.
'*He never made it to the other side.*'

Furthermore, we know that AEs are in fact available in (6a), (17a) and (19a) and the like (the sentences are ambiguous). If temporal modifiers shifted the Viewpoint Aspect of the clause they appear in, it is not clear why this shift would not always occur (making the AE outright impossible, contrary to fact).

5.5 Conclusion

This article argues that AEs, traditionally described as caused by the presence of a root modal under the perfective, are instances of a kind of aspectual coercion, which I label actualistic. Stative predicates of eventualities are not per se suitable complements of the perfective, and their meaning needs to be enriched by means of a syntactically represented operator. I show that root modal predicates are stative, therefore whenever they appear under the perfective, they are coerced. The observation that some non-modal stative predicates in the perfective give rise to the inference that an event took place provides evidence that AEs with root modals are indeed the outcomes of aspectual coercion.

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