LICENSING OF NEGATIVE POLARITY PARTICLES *YET*, *ANYMORE*, *EITHER* AND *NEITHER*: COMBINING DOWNWARD MONOTONICITY AND ASSERTIVITY

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I certify that I have read this dissertation and that, in my opinion, it is fully adequate in scope and quality as a dissertation for the degree of Doctor of Philosophy.

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Abstract

This dissertation focuses on the negative polarity items *yet*, *anymore*, *either* and *neither*, which I call *negative polarity particles* (NPP). Their distribution is examined and a licensing condition is proposed.

The negative polarity particles are licensed in many environments known to license negative polarity items. They are licensed by sentential negation, the words *few*, *rarely*, *barely*, the negative implicative verbs like *fail* and *refuse*, and the negative implicative constructions such as *without* with a clausal complement and *too* of excess:

(1) He didn't like me and I didn't like him *either*.

(2) Few Americans have ever been to Spain. Few Canadians have, *either*.

(3) That has rarely happened *yet*, but it's going to happen at lot.

(4) She barely acknowledged Ruthie, and *neither* did anyone else, understandably.

(5) I was too scared to hitchhike *anymore*.

On the other hand, the negative polarity particles are not licensed in antecedents of conditionals, restrictors of quantifiers, comparatives, superlatives and emotive factives.

(6) *Everyone who is here *anymore* will receive a prize.

(7) *If you have been to Amsterdam, you probably visited the Rijksmuseum, and *neither* have I.

(8) *I regret that my car has arrived *yet*.

(9) *I feel better than I have ever felt before *either*.

In this dissertation I propose assertivity as an additional condition needed to distinguish between these two sets of environments. Clausal assertivity is combined with downward monotonicity to create a complete licensing condition for the negative polarity particles. The brief definitions of clausal assertivity, downward monotonicity and the licensing condition are as follows. A clause *x* is downward monotone relative to *z* if the predicate position of *x* is downward monotone in *z*. A clause *x* is assertive

relative to *z* iff asserting *z* illocutionary entails asserting *x* or asserting ¬*x* with some assertion strength. A clause *x* is semantically negative relative to *z* if *x* is downward monotone relative to *z*, and *x* is assertive relative to *z*. A clause *x* is semantically negative iff there exists *z* (which may be *x* itself), such that *x* is semantically negative relative to *z*. Negative polarity particles are licensed in semantically negative clauses.

This condition explains the differences between the downward monotone clauses that license the negative polarity particles and those that do not. The downward monotone clauses in which the NPPs are licensed are also assertive and hence semantically negative. The downward monotone clauses in which the NPPs are not licensed, are not assertive relative to the clause containing the licenser, therefore such clauses are not semantically negative.

I also examine negative polarity particles in some other languages: Spanish *tampoco* ‘either’, French *non plus* ‘either’, German (*nicht*) *mehr* ‘anymore’ and Russian *bol’she* ‘anymore’. It is shown that these particles only occur in semantically negative environments. In addition, I investigate the relationship between the notion of semantic negativity and the notions of argumentative orientation and psycholinguistic negativity.

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1 Introduction

The topic of this thesis is a class of words that I will call *negative polarity particles*. The negative polarity particles in English include the words *yet*, *anymore*, *either*, and *neither*. These words, in their relevant sense, do not occur in simple positive sentences, but can occur in negative sentences, as the following examples demonstrate:

(1) This album is not released *yet*.

(2) This album is *already* released / *This album is released *yet*.

(3) I don't work there *anymore*.

(4) I *still* work there / * I work there *anymore*.

(5) He didn't like me and I didn't like him *either*.

(6) He liked me and I liked him *too*/**either*.

(7) You work for free, and *so*/**neither* do I.

(8) You don't work for free, and *neither* do I.

The negative polarity particles are a subclass of a larger class of words and expressions known as *negative polarity items*. These are words known to appear in negative sentences, and in other environments that share some properties with negation. The main question in the research on the negative polarity items is that of *licensing*, defining a condition that formally distinguishes between the environments in which the negative polarity items can occur and the environments in which they cannot occur. In this thesis I perform this task for the negative polarity particles. First, I examine their distribution and show how it is different from that of the other negative polarity items. I observe that the conditions proposed in the prior literature on negative polarity items are not adequate for the negative polarity particles and then I proceed with formulating an appropriate licensing condition.

The outline of this thesis is as follows. Chapter 2 contains a survey of previous literature on negative polarity items. From the origins of the research I proceed to the

notion of downward monotonicity, which was proposed as a licensing condition for negative polarity items. Then I discuss some problematic environments that require refining this condition. The chapter concludes with an in-depth examination of a number of classes of negative polarity items.

In chapter 3, I introduce the words that are the subject of this thesis: the negative additive focus particles *either* and *neither* and the negative aspectual particles *yet* and *anymore*. After making preliminary observations regarding their distribution, I show the similarities between these two types of particles. Chapter 4 contains a thorough examination of the distribution of the negative polarity particles. I observe that these particles are licensed in a subset of environments generally known to license negative polarity items. In chapter 5, I survey earlier accounts proposed for some of the negative polarity particles, including the anti-additivity hierarchy. It is shown that these accounts do not adequately describe the distribution of the negative polarity particles.

In chapter 6, I discuss the notion of *assertivity*, which is crucial for my explanation of the distribution of the negative polarity particles. I examine the earlier literature in which similar notions have been used, and a number of syntactic phenomena sensitive to assertivity. In chapter 7, I give a formal definition of assertivity that I use in this thesis. Based on this definition, I proceed to define the condition of semantic negativity, which combines downward monotonicity and assertivity. Various tests are proposed as diagnostics for assertivity. In chapter 8, I apply the condition of semantic negativity to the various environments described in chapter 4, and show that the distribution of the negative polarity particles in these environments is mostly correctly predicted by this licensing condition. I also examine the predictions of the licensing condition for additional environments. Some cases in which the distribution of the negative polarity particles is not correctly predicted by the condition of semantic negativity are also discussed.

In chapter 9, I discuss the notion of argumentative orientation and the phenomena that can be explained by this notion. It is suggested that the negative argumentative

orientation occurs in semantically negative environments, and that the role of the negative polarity particles is to signal a negative argumentative orientation.

Chapter 10 discusses various aspects in which the proposed licensing condition can be relevant for other problems. First, two aspects relevant to computational linguistics are discussed. I suggest that the notion of semantic negativity may be helpful for the task of sentiment classification, and propose an outline of an algorithm to calculate the projection of assertivity in sentences with multiple embeddings. Then I present aspects relevant to psycholinguistics. I discuss the relevance of the notion of assertivity for understanding the difference between the logical and psycholinguistic symmetry of quantifiers. I also suggest that the psycholinguistic negativity of quantifiers observed in some earlier works can be explained by semantic negativity. Finally, I compare the notions of assertivity and semantic negativity proposed in this thesis to related notions of assertoric inertia and veridicality proposed in earlier research on negative polarity items. I examine veridicality-based licensing conditions proposed for some negative polarity items, and observe that replacing veridicality with assertivity improves these conditions.

In chapter 11, I examine negative polarity particles in a number of languages other than English. The condition of semantic negativity proves to be a necessary licensing condition for the negative polarity particles in these languages. Some of these languages are also shown to have a kind of negative polarity particles not observed in English. Finally, chapter 12 contains the summary of the thesis and directions for further research.

2 Negative Polarity Items and their Licensing

2.1 Before downward monotonicity

The origin of the term "negative polarity items" (NPIs) is in the works of Baker (1969; 1970). It is known, he notices, that "whereas most words and idioms may occur in both affirmative and negative sentences, there are a handful which might be termed 'polarity-sensitive', in that they may occur only in affirmative, or only in negative sentences". Words and expressions that can occur only in affirmative sentences are called "affirmative polarity items" (now usually called "positive polarity items", PPIs), and those that can occur only in negative sentences are called "negative polarity items" (NPIs).

The following words and expressions are among the examples of negative polarity items, occurring in simple negative sentences, but not in simple affirmative sentences:

ever

(9) George won't *ever* see that movie.

(10) *George will *ever* see that movie.

be all that +Adj.

(11) The colonel isn't *all that bright*.

(12) *The colonel is *all that bright*.

any, and its combinations, such as *anybody*, *anything*:

(13) I didn't see *anything*.

(14) *I saw *anything*.

bother V-*ing*

(15) Bob probably won't *bother* leaving a number.

(16) *Bob will probably *bother* leaving a number.

The following words and expressions are examples of positive polarity items, occurring in simple affirmative sentences, but not in negative sentences:

would rather

(17) I would *rather* go to New Orleans.

(18) *I wouldn't *rather* go to New Orleans.

pretty (as a degree adverb):

(19) He did *pretty* well on the exam.

(20) *He didn't do *pretty* well on the exam.

Baker's papers are not the first ones discussing these items. A study that appeared a number of years earlier, Klima (1964), is now considered the beginning of the formal study of negative polarity items, although this term did not yet exist at that time. Klima examined the distribution of determiners like *any* and *some* and investigated the conditions under which *any* can be used. He noticed that when *any* is used in a negative sentence, *some* has to be used in the corresponding affirmative sentence:

(21) There wasn't *any* snow falling.

(22) There was some/**any* snow falling.

Klima proposes an explanation to these facts using the transformational approach prevalent at that time. The word *any* is seen as a result of a transformation operating on a sentence with *some* and resulting in a sentence with *any*. He calls this transformation *Indef*-incorporation. Simplifying somewhat, the quantifier *some*, when combined with *Indef*, is realized as *any*. This transformation can only occur in the scope of negation, which is represented by the syntactic feature *neg*. The ungrammaticality of *any* in (22) is explained by the inapplicability of the transformation when the syntactic feature *neg* is not present. On the other hand, in (21) *any* is under the scope of negation, so the transformation is allowed.

There are cases in which the "negative polarity items" can occur in sentences that are not syntactically negative:

(23) I doubt the colonel is *all that bright*.

(24) Scarcely *anybody* rejects suggestions.

(25) He disliked doing *any* more than necessary.

Klima (1964) deals with sentences like (23) – (25) by claiming that the words *doubt*, *scarcely*, and *dislike* incorporate a phonologically empty "negative affix" which carries the feature *neg*. These sentences are analyzed as being negative in a deeper syntactic sense. The negative polarity items are allowed, since they occur in the presence of *neg*, and *Indef*-incorporation is available to create them.

Klima (1964) then notices that the words *any* and *ever* can also be licensed by some environments that cannot be claimed to be negative[1]. Examples include questions, restrictors of quantifiers and antecedents of conditionals:

(26) Have you *ever* been to Illinois?

(27) If you have *any* idea, please share it.

(28) Everyone who has *any* interest in literature should get this book.

To solve this issue, Klima (1964) proposes a "grammatico-semantic feature" *Affective* that these environments share with the negative environments. That is, questions, antecedents of universals, and antecedents of conditionals all have this feature. Environments that have the feature *neg* automatically also have the feature *Affective*. The condition on Indef-incorporation is modified: this transformation is possible in the presence of the feature *Affective*. This condition unified sentences like (26) - (28) with negative sentence, identified by the feature *neg*, and the fact that *any* occurs in this condition is explained in this way.

There are a number of problems with Klima's condition. First, transformations are assumed to keep the meaning unchanged, so the sentence with *any* is expected to have the same meaning as the original sentence with *some*. Lakoff (1969) showed many

[1] It becomes clear at this point that "negative-polarity items" is somewhat of a misnomer. The items listed by Baker can occur in many environments which are not syntactically negative, as the examples above demonstrate. Nevertheless, this term has been used since Baker to denote these items, and I continue this usage.

cases in which both *some* and *any* can be used, but the meaning of the sentence with *some* is not quite the same as with *any*. For example, (29) is a warning, in which the speaker doesn't want the hearer to eat the candy, and the apodosis expresses the punishment which the hearer, presumably, would prefer to avoid. In (30), on the other hand, it seems that whipping is a desirable outcome for the hearer, and the sentence as a whole cannot serve as a warning. Since whipping is usually considered undesirable, (29) is a more natural-sounding sentence.

(29) If you eat *any* candy, I'll whip you.

(30) If you eat *some* candy, I'll whip you.

The sentences (31) and (32) demonstrate the opposite correlation. The more natural-sounding (31) suggests that receiving ten dollars is desirable for the hearer, and the sentence serves as encouragement to eat spinach. On the other hand, (32) with unstressed *any* suggests that receiving ten dollars is undesirable, and it sounds like a warning, which is less natural in this case.

(31) If you eat *some* spinach, I'll give you ten dollars.

(32) If you eat *any* spinach, I'll give you ten dollars.

A different kind of contrast is shown in the example below. The question with *any* suggests that the answer is negative, while the choice of *some* shows that there is a reasonable expectation that the answer can be positive:

(33) Do you think those people want to do some/any work?

These examples were used to argue that *any* cannot be seen as being derived from *some* by a meaning-preserving transformation. When both *some* and *any* can be used, the sentence with *some* can, in fact, have a different meaning than the sentence with *any*. The impact of the negative polarity items in questions and the negative bias introduced by *any* became a subject of later research (van Rooy 2003; Guerzoni 2004).

Another problem with Klima's proposal is its stipulative character. No explanation is offered of why some environments have the feature *Affective* and some do not. That is, Klima does not identify any independent common property of the environments

which results in the acceptability of *any*. This question became central for the research on negative polarity items following Baker's papers. It became known as the question of "licensing" (Ladusaw 1996): what are the environments that license the use of the NPIs? In other words, what is common to all the environments in which the NPIs can appear?

2.2 Downward monotonicity

A major step towards the answer to this question was made by Ladusaw (1980a), which was inspired by Fauconnier's (1975a; 1975b) earlier account of inferences on scales. Fauconnier observes that sentences with superlatives sometimes can function as universal quantification. For example, the sentence (34) below implies that Mary can solve all the relevant problems. However, not every sentence with a superlative has this property. For example, (35) does not lead to any implication of this kind.

(34) Mary can solve the most difficult problem.

(35) Mary can solve the easiest problem.

Fauconnier explains the difference between these two sentences by introducing the notion of pragmatic scales of proposition schemas. The sentences above belong to the scale containing sentences of the form *Mary can solve problem X*. The proposition schemas are associated with pragmatic scales so that the less likely propositions are located lower on the scale, and the truth of a proposition entails the truth of all the propositions above it. The least likely proposition entails the truth of all the propositions on the scale. This explains why (34) behaves like a universal. The sentence *Mary can solve the most difficult problem* denotes the least likely proposition in the schema *Mary can solve problem X*, it is the lowest point on the scale, and it entails all the other propositions. On the other hand, *Mary can solve the easiest problem* is located high on the scale and does not entail the other propositions. That's why (35) does not function as a universal quantification.

Fauconnier observed that introducing negation reverses the direction of the inferences on the scale. While (34) introduces a universal quantification, its negation

(36) does not. On the other hand, (35) does not introduce a universal quantification, and its negation (37) does.

(36) Mary can't solve the most difficult problem.

(37) Mary can't solve the easiest problem.

The explanation Fauconnier gives for this fact is that the direction of the inference is reversed when the propositions are replaced by their negation. While on the regular scales the inferences go 'upward', on the inverted scale the direction of the inferences is 'downward'. On the inverted scales the highest proposition is the least likely, and it is the one that entails all the other. This is why (37) behaves like a universal quantification, in the mirror image of the situation with the positive propositions. *Mary can't solve the easiest problem* is the least likely proposition, and it entails *Mary can't solve problem X* for different X. On the other hand, *Mary can't solve most difficult problem* is the most likely proposition on the schema, and it does not entail the other propositions. That is why (36) does not have the implication of universal quantification.

Ladusaw generalizes Fauconnier's observations by using the logical notion of *downward monotonicity*, or *downward entailment*. Informally, the direction of entailment in NPI-licensing positions is reversed compared to an ordinary positive sentence. The direction of inference in the object position of a simple positive sentence is from subset to superset:

(38) $[[\text{cat}]] \subseteq [[\text{pet}]]$

$[[\text{I have a cat}]] \Rightarrow [[\text{I have a pet}]]$.

Formally, upward monotonicity is defined as follows:

(39) Environment P(X) is *upward monotone* iff for every A, B such that $A \subseteq B$, $P(A) \Rightarrow P(B)$

When negation is introduced, the direction of inference is from a superset to a subset, the opposite of the direction in the affirmative sentence:

(40) [[cat]] $\subseteq$ [[pet]]

[[I don't have a pet]] $\Rightarrow$ [[I don't have a cat]]

Formally, downward monotonicity is defined as follows[2]:

(41) Environment P(X) is *downward monotone* iff for every A, B such that A $\subseteq$ B, P(B) $\Rightarrow$ P(A)

Ladusaw proposed downward monotonicity as a licensing condition for some negative polarity items, predicting that such negative polarity items occur only in downward monotone environments. The condition of downward monotonicity attempts to achieve what Klima (1964) did not do: specify the common property that environments called "affective" share. The environments that license the negative polarity items, both in the scope of negation, and non-negative, such as antecedents of conditionals, restrictors of universals, and sentences with *few* are downward monotone:

(42) Few people walked $\Rightarrow$

Few people walked slowly.

(43) If you eat a fruit a day, you will be healthy $\Rightarrow$

If you eat an apple a day, you will be healthy.

Negative polarity items are licensed in both arguments of the quantifier *no*, and in the first argument of the quantifier *every*. They are not licensed in the second argument of *every* or in either argument of *some* (Tovena 2001):

(44) a. No/every/*some student who had *ever* read *anything* on phrenology attended the lectures.

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[2] In a later paper Ladusaw (1980b) observes that the entailment should be tested given that the presuppositions of the sentences are satisfied: "The factivity of such predicates as *regret* obscures their true nature DE (downward entailing). For the purposes of determining whether an environment is DE, we should look only at situations in which the presuppositions of the sentences in question are satisfied". This observation is formalized as Strawson Downward Monotonicity discussed in section 2.3.2 below.

b. No/*every/*some student who attended the lectures had *ever* read *anything* on phrenology.

Downward monotonicity explains these facts. The reason for this distribution is that both arguments of *no* and the first argument of *every* are downward monotone, while the second argument of *every* and both arguments of *some* are upward monotone (45). In this case the NPIs are licensed in downward monotone environments.

(45) a. No student *has a pet* ⇒ No student *has a cat*.

b. No student who *has a pet* attended the lectures ⇒ No student who *has a cat* attended the lectures.

c. Every student *has a pet* ⇐ Every student *has a cat*.

d. Every student who *has a pet* attended the lectures ⇒ Every student who *has a cat* attended the lectures.

e. Some student *has a pet* ⇐ Some student *has a cat*.

f. Some student who *has a pet* attended the lectures ⇐ Some student who *has a cat* attended the lectures.

According to Ladusaw, downward monotonicity correctly predicts the behavior of the NPIs *any*, *ever* and *yet*, but not that of other NPIs such as *either*, *until*, or modal *need*. While this condition is quite successful in predicting the facts on NPI licensing in many environments, such as those examined by Klima (1964), there are other examples in which it is less clear that the predictions of this condition are correct. Some of these environments are discussed in the next section.

2.3 Downward monotonicity: modifications and restrictions

In this section I discuss a number of environments that seem problematic for the condition of downward monotonicity. They license negative polarity items, while not obviously being downward monotone. It is necessary to introduce additional constraints under which the environments can be shown to be downward monotone.

2.3.1 Conditionals

The antecedent clause of conditional sentences is an environment that may seem problematic for the licensing condition of downward monotonicity. Negative polarity items are licensed in this environment:

(46) If you have *any* pets, you must notify the landlord.

(47) If he has *ever* told a lie, he must go to confession.

In most cases, conditionals are downward monotone. For example, having $40,000 entails having $20,000, and when these phrases are put in the antecedent of the conditional, the direction of entailment is reversed:

(48) If you *have $20,000*, you can buy this car. =>

(49) If you *have $40,000*, you can buy this car.

However, in many cases such entailment does not hold. This is known in the literature on conditionals as the problem of "strengthening the antecedent". In the following cases, unlike the example above, strengthening the antecedent does not lead to a sentence entailed by the original sentence (Lewis 1973; Heim 1984; von Fintel 1999):

(50) a. If I strike this match, it will light. =/>

b. If I dip this match into water and strike it, it will light.

(51) a. If kangaroos had no tails, they would topple over. =/>

b. If kangaroos had no tails but used crutches, they would topple over.

(52) a. If John subscribes to a newspaper, he must be well informed. =/>

b. If John subscribes to a newspaper that he can't read, he must be well informed.

If no further explanation is given, these examples can be taken to demonstrate that the antecedent of the conditional is not a downward monotone environment. In all these examples the first sentence can be evaluated as true, and the second sentence as false. This would be problematic for downward monotonicity as a licensing condition.

Kadmon and Landman (1993) and von Fintel (1999) discuss such pairs in order to establish the conditions under which the antecedent of the conditional is downward monotone. They notice that in all these pairs the first and the second sentence are not evaluated under the same assumptions. The term used by von Fintel (1999) is "modal horizon": the possible worlds that are considered when the sentence is evaluated. In all the pairs, when the first sentence is evaluated, some possibilities are not considered which are considered when the second sentence is evaluated. For example, in (52), when the first sentence is evaluated, only worlds in which John subscribed to a newspaper that he can read are considered. Subscribing to a newspaper that one cannot read is unreasonable, and such an option is not considered. Therefore, the truth value of the sentence can be reasonably taken to be true. On the other hand, when the second sentence of (52) is evaluated, this option of John not being able to read the newspaper is mentioned explicitly, and this way it is introduced into the modal horizon. The truth value of the sentence is then evaluated as false.

There are a number of ways to show that the possible worlds being considered for the evaluation of the sentence change. One way is to combine the sentences with the two kinds of the antecedents into one utterance. For example, the first sentence of (52) can be reasonably followed by the negation of the second one, as shown in (53). The other order is not possible: the negation of the second sentence cannot be followed by the first one, as demonstrated in (54).

(53) If John subscribes to a newspaper, he must be well informed. But if John subscribes to a newspaper that he can't read, he will not be well informed.

(54) #If John subscribes to a newspaper that he can't read, he will not be well informed. But if John subscribes to a newspaper, he must be well informed.

The reason is that once the extra worlds are introduced into consideration, they cannot be ignored. Introducing the possibility explicitly mentioned in the antecedent of the second sentence make the first sentence false, just as the second sentence is. To summarize, before the modal horizon is extended, the first sentence of (52) is true. After it is extended, both sentences are false. There is no modal horizon under which the first sentence is true and the second one is false.

Another way to show this is by the plausibility of the following discourse:

(55) A: If John subscribes to a newspaper, he must be well informed.

B: If John subscribes to a newspaper that he can't read, he will not be well informed.

C: This means that if John subscribes to a newspaper, he is not necessarily well informed.

First, the original sentence is presented is true. Then the second sentence expands the modal horizon by explicitly mentioning a possibility which was not considered before. Once this happens, one notices that the original sentence changes the truth value with respect to the expanded modal horizon – it becomes false.

Kadmon and Landman (1993) and von Fintel (1999) maintain that the antecedent of a conditional is downward monotone when the context of the evaluation of the sentences is kept constant. Since in the pairs above the second sentence shifts the context, they do not constitute a counterexample to this generalization. Therefore, the antecedent of a conditional is not a counterexample to the NPI-licensing condition of downward monotonicity: the NPIs are licensed and the environment is indeed downward monotone.

2.3.2 *Only*, emotive factives, and Strawson Downward Monotonicity

The second argument of *only* is among the environments known to license negative polarity items:

(56) Only three players ate *anything* at all.

(57) Probably only a handful *ever* saw Jerome again

This environment is not obviously downward monotone, according to the simple definition of downward monotonicity. Let's consider the following example:

(58) Only John ate *vegetables* for breakfast =/>

(59) Only John ate *kale* for breakfast.

This entailment does not hold. For example, in the case that John ate spinach for breakfast, and no one else had any vegetable, the premise is true and the conclusion is not obviously true. Therefore, this environment is not downward monotone according to the simple definition. This is problematic since apparently this is a case of negative polarity items licensed in an environment which is not downward monotone.

The issue of NPI licensing by *only* is addressed by von Fintel (1999). He alters the definition of downward monotonicity, so that licensing in terms of the modified definition accounts for a number of additional environments. The definition he gives is as follows:

(60) Strawson Downward Monotonicity

A function f of type $<\sigma, \tau>$ is Strawson-DM iff

for all x, y of type σ such that $x \Rightarrow y$ *and f(x) is defined* (*the presuppositions of f(x) are satisfied*), $f(y) \Rightarrow f(x)$

The italics show what is added to the original definition. This definition is based on the notion of Strawson-validity that von Fintel developed, after on a suggestion by Strawson (1952). Strawson-validity is defined as follows:

(61) Strawson validity (Strawson-entailment)

An inference $p_1, \ldots, p_n \therefore q$ is Strawson-valid iff

The inference $p_1, \ldots, p_n$, ps(q) $\therefore$q is classically valid.

[ps(q) denotes the presuppositions of q]

Therefore, *p* Strawson-entails *q* if $p \wedge ps(q)$ entails q. The definition of Strawson-DM is, in fact, downward monotonicity with standard entailment replaced by Strawson-entailment. The definition of Strawson-DM can also be formulated as follows: f is Strawson-downward monotone if for all x, y such that $x \Rightarrow y$, the entailment $f(y) \Rightarrow f(x)$ is Strawson-valid.

As mentioned above, the need to take presuppositions into the account was noted earlier by Ladusaw (1980b). Therefore, Strawson downward monotonicity can be seen as a more precise formulation of the original proposal of Ladusaw. As we will see in

this chapter, Strawson downward monotonicity accounts for NPI licensing better than downward monotonicity examined regardless of the presuppositions. In the rest of the dissertation, I will use the terms *downward monotonicity* and *downward monotone environment* to refer by default to Strawson downward monotonicity and Strawson downward monotone environment, respectively.

Let us now examine whether the second argument of *only* is a Strawson-DM environment. For Strawson-DM, we check the entailment from (62) to (63), given that the presuppositions of the conclusion (63) are satisfied.

(62) Only John ate *vegetables* for breakfast =/>

(63) Only John ate *kale* for breakfast.

The usual analysis of such sentences recognizes that their truth conditions involve two propositions of different status. For example, (62) combines the following two propositions:

(64) Exclusive: No one who is not John ate vegetables for breakfast.

Prejacent: John ate vegetables for breakfast.

The exclusive proposition is undoubtedly asserted. The prejacent component is frequently considered to be presupposed (Horn 1969) or otherwise not asserted (Horn 1996, 2002). Horn (1969) presents an argument in favor of this analysis. An interrogative sentence with *only* asks about the exclusive proposition, and not about the prejacent. A negative answer followed by the negation of the prejacent (65) is less acceptable than the negative answer followed by the negation of the exclusive proposition (66). The presuppositions of a sentence usually survive in a question, and the question refers to the assertion of a sentence. Therefore, the difference in the acceptability of (65) and (66) suggests that the exclusive component is asserted and the prejacent is presupposed.

(65) #Did only Muriel vote for Hubert? No, she didn't.

(66) Did only Muriel vote for Hubert? No, somebody else did as well.

Another argument is presented by Horn (1996), based on the contrast between (67) and (68). While the prejacent proposition can potentially be suspended (67), the exclusive proposition cannot (68). This suggests that the exclusive proposition belongs to the assertion of the sentence, and the prejacent composition is not asserted.

(67) Only Kim can pass this test, and it's possible that even she can't.

(68) #Only Kim can pass this test, and/but it's possible that someone else can.

Adopting this analysis, Ladusaw (1980a) and von Fintel (1999) analyze (62) as presupposing *John ate vegetables for breakfast* and (63) as presupposing *John ate kale for breakfast*. To examine Strawson downward monotonicity we check whether (62), together with the presupposition of (63), entail (63). If we know that *Only John ate vegetables for breakfast*, and *John ate kale for breakfast*, we can safely conclude that *Only John ate kale for breakfast*. Indeed, if no one other than John ate vegetables for breakfast, no one other than John ate kale for breakfast, which is the assertion of (63). The entailment from (62) to (63) is therefore Strawson-valid, and the environment created by *only* is Strawson downward monotone. Adopting Strawson downward monotonicity as the licensing condition explains the licensing of the negative polarity items in this environment.

This analysis is challenged by Giannakidou (2006). Giannakidou notes that in some versions of Horn's analysis (Horn 1996) the presupposition of *only* is described differently:

(69) Only John ate a vegetable.

Presupposes: Someone ate a vegetable.

Asserts: Nobody other than John ate a vegetable.

Giannakidou observes that the presupposition *someone ate a vegetable*, added to the original premise (58), is not enough for establishing an entailment from (58) to (59). Indeed, if we know that *only John ate vegetables* and *someone ate a vegetable*, we cannot conclude that *only John ate kale*, for maybe he ate some other vegetable. Based on this observation, Giannakidou concludes that the second argument of *only* is not a Strawson-DM environment.

It seems that Giannakidou's conclusion results from a confusion. In the pair of sentences (58) and (59), what is examined is whether the argument from *only John ate vegetables for breakfast* to *only John ate kale for breakfast* is Strawson-valid. To examine Strawson-validity, we add the presupposition of the conclusion (59) to the premises (58). In this case the potential conclusion is *only John ate kale for breakfast*, which has a presupposition *John ate kale for breakfast*, or *someone ate kale for breakfast*. Either of these presuppositions, when added the premise, makes the argument valid.

Instead of taking the presupposition of the conclusion (59), what Giannakidou does is taking the presupposition of the premise (58). In this entailment *only John ate a vegetable*, whose presuppositions and assertion are presented by Giannakidou in (69), is a premise, and not a conclusion. Taking the presupposition of a premise and adding it to the premise is a step which, in fact, does not at all affect the validity of an argument. A premise entails a conclusion if whenever the premise is true, the conclusion is true as well. That is, we assume that the premise is true, and examine whether the conclusion is true. If the premise is true, its presuppositions are true as well, so adding them to the premise does not have any effect. If Giannakidou had taken the presupposition of the conclusion and added them to the premises, the result would be, as seen in von Fintel (1999), that the argument holds and the environment created by *only* is indeed Strawson-DM.

Another environment in which the NPIs are licensed despite apparent lack of downward monotonicity is the complement of so-called adversative predicates. These include negative emotive and epistemic factive predicates, such as *be sorry* and *be surprised*. The corresponding positive predicates do not license negative polarity items:

(70) I'm sorry/*glad I spent *any* money on it.

(71) I'm sorry/*glad I *ever* met you.

(72) I'm surprised he *ever* forgave me.

The complement of the adversative *sorry* is not obviously downward monotone:

(73) Robin bought a Honda Civic ⇒ Robin bought a car.

(74) Sandy is sorry that Robin bought a car =/>

(75) Sandy is sorry that Robin bought a Honda Civic.

Let's now examine whether this environment is Strawson-DM. Since *sorry* is a factive predicate, the conclusion (75) has the presupposition that *Robin bought a Honda Civic*. However, it seems that the entailment does not hold even if we add the presupposition, as the following sequence demonstrates:

(76) Sandy is sorry that Robin bought a car. But Sandy is glad that Robin bought a Honda Civic.

According to von Fintel (1999), this sequence is made possible due to a context shift between the two sentences. The first sentence of (76) is evaluated with the possible worlds including those in which Robin does not buy a car. In the second sentence of (76) the only possible worlds are considered are those in which Robin does buy a car. The shift in the context is similar to that happening with conditionals, as described in section 2.3.1 above.

This brings us to the question of the semantics of *glad* and *sorry*. In the analyses of Kadmon and Landman (1993) and von Fintel (1999) the semantics of these predicates are closely connected to that of the predicates *wish* and *want*. Indeed, if I am *sorry that* p, then I would like *p* not to have happened, or I wish that it hadn't happened. Similarly, if I am *glad that p*, then I would want it to happen. The difference between *glad* and *want* is in the presuppositions. While *glad* presupposes the truth of the complement, *want* presupposes that it is not known whether the complement is true.

Kadmon and Landman (1993) adopt a monotone semantics of *want*[3]. The phrase *x wants that p* is analyzed to mean that *p* is true in the preferred worlds of *x* in the modal base. This is also taken to be the assertion of *glad*. The phrase "x *is sorry that* p" is

[3] Other studies (Asher 1987; Heim 1992) defend different versions of non-monotone semantics of *want* and related predicates.

analyzed to have the same assertion as "x *wants that* ¬p", so, the phrase "*x is sorry that p"* is taken to assert that *p* does not happen in the preferred worlds of *x*.

This way, if Sandy is sorry that Robin bought a car, then in each of the preferred worlds of Sandy, Robin does not buy a car. Since not buying a car entails not buying a Honda, in the preferred worlds of Sandy Robin does not buy a Honda, which is exactly the semantics for *Sandy is sorry that Robin bought a Honda*. Therefore, according to this analysis the complement of *sorry* is Strawson-DM.

We can contrast this observation with the complement of *glad*. To establish whether this environment is Strawson-DM, let's consider the following examples:

(77) Sandy is glad that Robin bought a car. (⇒?)

(78) Sandy is glad that Robin bought a Honda Civic.

For Strawson-entailment, we add the presupposition of the conclusion (78), *Robin bought a Honda Civic*, to the premises (77). If Sandy is glad that Robin bought a car, then in the preferred worlds of Sandy, Robin buys a car. This does not necessarily mean that he buys a Honda in each of the perferred worlds, as it is possible that in some of Sandy's preferred worlds Robin buys a car of a different model. Therefore, it is not necessarily true that *Sandy is glad that Robin bought a Honda Civic*; this shows that the complement of *glad* is not a Strawson-DM environment.

With Strawson-DM as the licensing condition for the NPIs, the predictions of this analysis of *sorry* and *glad* are that the NPIs are licensed by *sorry*, but not by *glad*. This fits the observations discussed above.

Giannakidou (2006) objects to this analysis as well. She observes that the presupposition of *Larry regrets that John bought a car* is not *John bought a Honda*, but rather *John bought a car*. Therefore, she concludes, *Larry regrets that John bought a car* does not Strawson-entail that *Larry regrets that John bought a Honda*. However, this is not how Strawson-entailment is defined. It is the presupposition of the conclusion (78) that needs to be added to the premises (77), not the presupposition of the premises. The presupposition of the conclusion is exactly *John bought a Honda*, and the entailment holds, as shown above.

This analysis can also explain the difference in NPI-licensing between another pair of verbs, *criticize* and *accuse*, noticed by Linebarger (1991:174):

(79) He criticized me for saying *anything* to John about the debacle.

(80) *He accused me of saying *anything* to John about the debacle.

According to Linebarger, this contrast cannot be explained by downward monotonicity. However, this contrast can be explained if the semantics of the verbs is examined more closely. Fillmore (1971:381) examined these two verbs in examples like the following:

(81) Harry accused Mary of writing the editorial.

(82) Harry criticized Mary for writing the editorial.

According to Fillmore's analysis, the difference between these two verbs is as follows. The speaker using the verb *accuse* (81) presupposes that the activity in the complement is 'bad', and asserts that Harry claimed that Mary was the one who did it. On the other hand, the speaker using *criticize* (82) presupposes the truth of the complement, and asserts Harry's negative opinion towards it. Therefore, *criticize* is a negative emotive factive verb, and with an analysis similar to the one proposed for *sorry* above, its complement can be shown to be a downward monotone environment. This does not hold for *accuse*, hence the difference in NPI licensing.

2.3.3 *Before* and *after*

From the very beginning, research on negative polarity items has shown that the NPIs are licensed by *before*:

(83) I left before ordering *anything* off the menu.

In order to examine the monotonicity properties of the complement of *before*, we must first find the correct analysis of its semantics. The truth conditions of 'A before B' are generally agreed upon: 'A before B' is true if A happened before the earliest moment in which B happened (Anscombe 1964; Beaver and Condoravdi 2003). The main variation in the use of *before* is that sometimes it can be used to imply that its

complement is true (84), sometimes that it is false (85), and sometimes, as in (86), it is compatible with both interpretations (Heinämäki 1972):

(84) Before Sue punched anyone, she was miserable.

(85) Before Sue punched anyone, she left the party.

(86) John shut up before Harry got mad at him.

When the sentence entails the truth of the complement, this entailment is the presupposition of the sentence, and not the assertion. Therefore, according to the rule of Strawson-DM, the downward monotonicity is to be examined supposing that the presupposition is satisfied.

(87) Before Sue *punched anyone*, she was miserable. ⇒

(88) Before Sue *punched John*, she was miserable.

When the truth of the complement is not entailed, the downward monotonicity holds as well:

(89) I left <u>before</u> ordering *anything* off the menu. ⇒

(90) I left <u>before</u> ordering *anything* expensive off the wine menu.

We see that regardless of whether or not the complement of *before* is implied to be true, this environment is downward monotone, and the licensing of the negative polarity items is correctly predicted.

The conventional view in the early NPI licensing literature was that *after* does not license negative polarity items:

(91) After Sue punched someone/**anyone*, she left the party.

Linebarger (1987:370) noticed that in some cases sometimes *after* can license NPIs:

(92) He kept writing novels <u>long after</u> he had *any* reason to believe they would sell.

(93) *He kept writing novels <u>long after</u> he retired to *any* Caribbean island.

The explanation of the NPI-licensing behavior of *after* must include the difference between *after* and *before* in most cases, and the licensing by *after* in the rare cases. The asymmetries between *before* and *after* were noticed by Anscombe (1964), who postulated the following semantics of these words:

(94) 'A before B' is true iff $(\exists t \in A)\ (\forall t' \in B)\ t < t'$

'A after B' is true iff $(\exists t \in A, t' \in B)\ t > t'$

In addition to the difference in NPI-licensing properties, *before* is asymmetric and transitive; *after* is neither. Among the following statements, (95) and (96) cannot be true together, but (97) and (98) can (Beaver and Condoravdi 2003).

(95) Cleo was in America before David was in America.

(96) David was in America before Cleo was in America.

(97) Cleo was in America after David was in America.

(98) David was in America after Cleo was in America.

According to this analysis, *after* is not DM, and this can be demonstrated by the following example:

(99) I met John after he became a writer. $\Rightarrow$

(100) I met John after he became a successful writer.

This entailment does not hold even if we assume the truth of the complement of after, since it is possible that I met John after he became a writer, but before he became a successful writer.

Anscombe's analysis of *after* explains why this word does not usually license NPIs, but does not explain the examples in which it does. Beaver and Condoravdi (2003) introduce an analysis of *before* and *after* according to which *after* can have two interpretations. One interpretation is the same as proposed by Anscombe – 'A after B' is true if A happened after some moment in which B held or occurred. The second interpretation is the inverse of the analysis of *before* – 'A after B' is true if A is true after *the last* moment of the interval in which B holds. In the second, "endpoint",

interpretation, *after* is asymmetric, transitive and downward monotone, just like *before* is. The second interpretation is only available for predicates that are true in an interval, and not for punctual events. The reason for the downward monotonicity of the complement of *after* in the second interpretation is that if A occurs after the last moment of an interval B, it is also true that A occurs after the last moment of any subinterval B' of B. This can be demonstrated by the following entailment:

(101) He kept writing novels long after he had *any* reason to believe they would *sell in large numbers*. ⇒

(102) He kept writing novels long after he had *any* reason to believe they would *sell*.

This analysis predicts that the NPIs are licensed by *after* if and only if it has the second interpretation. This is indeed what happens: in all the cases that negative polarity items are licensed with *after*, such as (92) and (103), it has the endpoint interpretation. In cases like (93), which denote punctual events, the second interpretation is not available and the NPIs are not licensed.

(103) Some say the cuts were made after there was *any* real use for them.

We can conclude that the condition of downward monotonicity correctly describes the distribution of negative polarity items with *before* and *after*.

2.4 Downward Monotonicity: Problems

A number of contrasts in the licensing of negative polarity items cannot be explained by the differences in downward monotonicity alone. One of these shows a difference in the licensing of NPIs depending on the choice of the quantifier in a different constituent. The negative polarity item *give a red cent* is licensed in (105), but is not licensed in (104). This contrast is known as "the intervention effect" (Linebarger 1987:352; Jackson 1995:187). In both (104) and (105) the environment of this item is downward monotone, as demonstrated in (106) and (107).

(104) *John didn't *give a red cent* to every charity.

(105) John didn't *give a red cent* to any charity.

Both these environments are downward monotone:

(106) John didn't give $5 to every charity =>

John didn't give $10 to every charity.

(107) John didn't give $5 to any charity =>

John didn't give $10 to any charity.

A similar effect can be demonstrated with the NPI *any*:

(108) *No student gave every teacher *any apples*.

(109) No student gave a teacher *any apples*.

Negative polarity items are sometimes licensed by numeric phrases of the type *exactly n* (Linebarger 1987:373; 1991:175):

(110) Exactly three pictures have *any* relevance

(111) Exactly four people in the whole world have *ever* read that dissertation.

The second argument of *exactly n* is not downward monotone:

(112) Exactly four people *have read this book* =/>

Exactly four people *have read this book three times*.

As noted by Linebarger, the NPIs are licensed by *exactly* only if the number is perceived to be small:

(113) Exactly four people in the whole room *budged an inch* when I asked for help.

(114) *Exactly 43 people in this room will have to *budge an inch* to make room for the later arrivals.

The reason for the difference between these two sentences seems to be in the speaker implicature. In (113) the phrase *exactly four people budged an inch*, in which the number is relatively small, is used to imply *only four people budged an inch*, in which the NPI expression is in a downward monotone environment. Such an interpretation is impossible for (114), since 43 is not a small number of people. This

difference is ignored when the downward monotonicity of the environment is tested in the original sentence.

Linebarger (1991:174) also notes that in some cases negative polarity items are licensed in environments of complement-taking verbs, although they are not downward monotone. In some cases, such as emotive factives, the environment can be shown to be Strawson-DM, as discussed above. In other cases, the environments are not Strawson-DM, either. Sometimes there is a striking difference in licensing between similar predicates, as examples below show[4].

(115) If you are going to convict him, you'll need to prove that there's *anything* illegal about what he did.

(116) *If you are going to convict him, you'll need to provide *any* photographs of the drug transaction.

Negative polarity items are sometimes licensed by 'removal'-type predicates, such as *eliminate* or *destroy* (Hoeksema and Klein 1995; Joe and Lee 2002). Unlike predicates of absence, such as *lack* or *devoid of*, predicates of removal are not downward monotone.

(117) His death destroyed *any* remaining illusions.

(118) I destroyed a house. =/>

I destroyed a wooden house.

As mentioned in section 2.1 above, Lakoff (1969) notes that in some cases, when referring to potential events, *some* is appropriate with desirable outcomes, while *any* is better with undesirable outcomes. In (119), which describes a desirable outcome, *some* is the more natural choice, while *any* is the more natural choice in (120):

(119) If you eat some/#any spinach, I'll give you ten dollars.

(120) If you eat any/#some candy, I'll whip you.

[4] Some speakers find both examples acceptable.

When a complement-taking predicate expresses a particular emotional attitude, the choice of the determiner becomes more restricted. For example, *warn* introduces an undesirable outcome, so in this case only *any* is possible (121). On the other hand, *promise* introduces a desirable outcome, so *any* cannot occur and *some* is the only choice (122).

(121) I warn you that, if you eat *any*/**some* candy, I'll whip you.

(122) I promise you that, if you eat *some*/**any* spinach, I'll give you ten dollars.

The logical structure of these two sentences is the same. In both sentences the environment – an antecedent of a conditional – is downward monotone, so the difference in licensing cannot be explained by downward monotonicity.

Interrogative sentences are also among the environments in which negative polarity items are licensed:

(123) Did *anybody* call?

(124) Who has *any* idea?

This fact is problematic for the hypothesis that downward entailment is the licensing condition. The obvious problem is that the basic notion of entailment only holds for propositions. Proposition A entails proposition B if whenever A is true, B is true as well. Since questions, under the usual analyses, are not true or false, this definition does not apply.

In a series of papers, Groenendijk and Stokhof (1989) demonstrate how the notion of entailment can be applied to questions. Their definition is as follows[5]:

(125) A question A entails a question B iff

Whenever a proposition gives a complete and true answer to A,
it gives such an answer to B.

[5] This is similar to the semantics of questions proposed by Harrah (1961), Hamblin (1973) and Karttunen (1977).

The following pair of questions demonstrates how one question can entail the other: (126) entails (127). Whenever we know the answer to (126), we also know the answer to (127). For example, if the answer to (126) is *John and Bill went to San Francisco yesterday*, the answer to (127) is *John went to San Francisco yesterday*. If the answer to (126) is *Bill and Dan went to San Francisco yesterday*, the answer to (127) is *John didn't go to San Francisco yesterday*.

(126) Who went to San Francisco yesterday?

(127) Did John go to San Francisco yesterday?

We can use this notion of entailment between questions to examine whether the interrogative sentences that license negative polarity items are downward monotone. According to it, polar sentences are usually not downward monotone. For example, knowing the answer to (128) does not ensure knowing the answer to (129). If we know that the answer to (128) is positive, that is, we know that *John went somewhere yesterday*, we still don't know whether the answer to (129) is positive or negative.

(128) Did John go anywhere yesterday? =/>

(129) Did John go to San Francisco yesterday?

Similarly, wh-questions are not downward monotone in positions outside the *wh*-phrase:

(130) Who brought a cake? =/>

(131) Who brought a chocolate cake?

However, wh-questions are downward monotone in the environment of the *wh*-phrase. If we know the answer to (132), we also know the answer to (133).

(132) Which faculty members live in Palo Alto? =>

(133) Which permanent faculty members live in Palo Alto?

NPIs are licensed in polar questions (134) and in wh-questions, both within the *wh*-phrase (135) and outside the *wh*-phrase (136):

(134) Have you *ever* been to China?

(135) Who, of those who have *ever* been to China, visited Sichuan?

(136) Who has *anything* to eat?

Therefore, the condition of downward monotonicity does not explain the licensing of negative polarity items in questions, at least not with the notion of entailment between questions. Many later studies develop alternative explanations of NPI-licensing in questions (Han and Siegel 1997; van Rooy 2003; Guerzoni 2004; Romero and Han 2004).

2.5 Linebarger – licensing by negative implicature

Linebarger (1987; 1991) observes the many contrasts discussed in the previous section, and concludes that downward monotonicity is not an appropriate licensing condition for the negative polarity items. She proposes a different condition: licensing by negative implicature, emphasizing the pragmatic contribution of the negative polarity items. This condition is formulated as follows (Linebarger 1987:346):

(137) A negative polarity item N contributes to a sentence S expressing a proposition P the conventional implicature that the following conditions are satisfied:

> Availability of negative implicatum: There is some proposition NI (which may be identical to P), which is implicated or entailed by S and which is part of what the speaker is attempting to convey in uttering S. In the LF of some sentence S' expressing NI, the lexical representation of the NPI occurs in the immediate scope of negation.
>
> Strength: The truth of NI, in the context of the utterance, virtually guarantees the truth of P.

For example, she proposes to account for the licensing of NPIs in the second argument of *few* with the following negative implicature:

(138) Few people had *anything* to eat.

> NI: Most people <u>didn't</u> have anything to eat.

The licensing of NPIs with *exactly n*, when *n* is small is explained by the availability of the negative implicature in that case. While (139) is analyzed as having the negative implicature as shown below, (140) is claimed not to have such an implicature.

(139) Exactly four people in the whole room *budged an inch* when I asked for help.

NI: most people didn't budge an inch when I asked for help.

(140) *Exactly 43 people in this room will have to *budge an inch* to make room for the later arrivals.

This type of explanation has a number of problems. First, many positive sentences that do not license negative polarity items can have syntactically negative implicatures. This is the case with the quantifier *almost everyone*, as shown in (141). Therefore, Linebarger's condition cannot distinguish between *few*, which licenses NPIs, and *almost everyone*, that does not.

(141) *Almost everyone had *anything* to eat.

NI: Few people didn't have anything to eat.

Second, some of the negative implicatures proposed by Linebarger do not satisfy her own condition. For example, the negative implicatum in (139) does not satisfy the strength condition. The negative implicature is not stronger than the original proposition, and the truth of NI does not 'virtually guarantee' the truth of P. It is possible that the NI in (139) is true, but the original sentence is false, as the number of people who responded was three or five.

Third, the condition allows the licensing of the NPI if there is *some* sentence S' expressing an appropriate NI. Therefore, to show that a sentence is predicted not to license NPIs, one must show that there is no sentence S' that can express an appropriate NI. Linebarger does not address this issue and does not demonstrate how this can be accomplished formally. In fact, in most cases when Linebarger claims that there is no negative implicature, such an implicature can be found, as in (141) above.

Although Linebarger collected together a good amount of contrasts that have to be explained, her own proposal does not explain them adequately, and, in fact, is less successful than downward monotonicity in explaining the distribution of negative polarity items.

2.6 Negative Polarity Items and Free Choice Items

In addition to its regular use in the NPI-licensing environments, the English word *any* has another use, in which it has a so called "free choice" interpretation. Examples are given below:

(142) *Anybody* can solve this problem.

(143) I can catch *any* raven.

(144) Press *any* key.

In this use *any* is frequently called "a free choice item" (FCI). There has been much debate on whether the NPI-*any* and the FCI-*any* should be given a unified analysis or two different analyses. The proponents of the separate analysis usually see the FCI-*any* as a universal (Quine 1960; Dayal 2004), based on sentences like (142), which is similar in meaning to *Everybody can solve this problem*. The proponents of the unified analysis usually see the FCI-*any* as existential (Kadmon and Landman 1993; Horn 2005), based on examples like (144), which is not equivalent to *Press every key*.

The free choice reading does not just arise by virtue of *any* occurring in the appropriate environment, such as modal or imperative. The FC reading also occurs in the regular NPI-licensing environments, in which case *any* can be ambiguous between NPI and FC interpretations, as in the following examples:

(145) If she can solve *any* problem, she'll get a prize.

NPI reading: If there is any problem she can solve…

FC reading: If she can solve every problem,…

(146) Can *anyone* pass this test?

NPI reading: Is there anyone who can pass this test?

FC reading: Can everyone pass this test?

Horn discusses a number of syntactic contrasts that can help distinguish between the free choice and the NPI readings. One of the contrasts involves existential sentences. The NPI *any* can appear in an existential sentence with *there is* (147), while the FC *any* cannot (148).

(147) There isn't *anybody* that can swim the Channel.

(148) *There is *anybody* that can swim the Channel.

Another test involves the use of adverbs *absolutely* and *almost*. It has been claimed that while the NPI *any* cannot be qualified by these adverbs (149), the free choice *any* can (150):

(149) Sam didn't see (*absolutely) *anyone*.

(150) Absolutely *anyone* can cook Peking duck.

However, Horn (2005) showed that there are examples of *almost* with the NPI *any*, such as (151), so this test is not completely reliable.

(151) He doesn't know almost *anything* about programming.

Many languages have different words for the free choice and the NPI interpretations of *any*. Such are, for example, Greek, with the NPI *kanena* and FCI *opjosdhipote*, and Spanish, with the NPI *ningún* and the FCI *cualquier*. The following examples demonstrate the use of Russian FCI *ljuboj* and the NPI *nikakoj*.

(152) **Ja videl ljubogo/nikakogo studenta*.

I saw any-FCI/any-NPI student.

'I saw any student'.

(153) *Ja ne videl nikakogo / *ljubogo studenta*.

I not saw any-NPI/any-FCI student.

'I didn't see any student'.

(154) *Èto ljuboj/*nikakoj student znaet*.

This any-FCI/any-NPI student knows.

'Any student knows this'.

When these words occur in environments allowing both the NPI and the FCI, the resulting sentences are not ambiguous, as each word corresponds to only one interpretation of the English *any*:

(155) *Ja ne mogu rešit' nikakuju zadaču*.

I not can solve any-NPI problem.

'I can't solve any problem' = 'I can solve none of the problems'

(156) *Ja ne mogu rešit' ljubuju zadaču*.

I not can solve any-FCI problem.

'I can't solve any problem' = 'It's not the case that I can solve any problem'.

There is a crucial difference between the notions of NPI and FCI. Negative polarity item is a notion based on the distribution of an item, in which environments it can appear and in what it cannot. This notion can apply to an expression of any syntactic category. On the other hand, 'free choice' is a particular interpretation of a referring expression, and is usually only applied to indefinite pronouns. Therefore, free-choice vs. non-free-choice can be seen as another distinction in the interpretation of referring expressions, similar to the referential/attributive (Donnellan 1966) and *de re / de dicto* (McKay and Nelson 2006) contrasts. Words and expressions of most other syntactic categories cannot become free choice items, so the problem of distinguishing between NPIs and FCIs does not occur for most categories of NPIs.

2.7 Diversity of NPIs: recognizing the classes

2.7.1 Introduction

In the earlier stages of the research on negative polarity items it was sometimes assumed that it would be possible to give one explanation for the behavior of all the negative polarity items. The research frequently examined the behavior of one item, or a small group of items, and it was assumed that they are representative of all the

negative polarity items. Recent research recognizes the diversity of the negative polarity items. Zwarts (1995) and van der Wouden (1997) introduce a hierarchy of negative polarity items based on their distribution, and propose a number of conditions stronger that downward monotonicity. I discuss this hierarchy in section 5.1 below. Many other studies focus on a particular subclass of negative polarity items and examine their properties. In this section I describe a number of such classes: indefinite pronouns, morphological markers, minimizers and maximizers.

2.7.2 Indefinite pronouns

The word *any* and its compounds like *anybody, anything* belong to the class of negative polarity items which are indefinite pronouns. In a study made from the typological perspective Haspelmath (1997) examined the distribution of different kinds of indefinite pronouns in 40 languages, including English. His focus is not on negative polarity items in particular, but rather on describing the distribution of all the types of indefinite pronouns in the different languages. In many languages the indefinite pronouns come in series, such as the English *any*-series (*anybody, anything*) and *some*-series (*somebody, somewhere*, etc.) For English, he examined the *any*-series, the *some*-series, the *no*-series, and the word *ever*.

Haspelmath summarizes the results by presenting the environments he examined as a semantic map shown in Figure 1. The names of some of the environments are self-explanatory: negation, question, indirect negation, comparative, conditional and free choice. The pronoun is said to have a non-specific use if it does not refer to a particular object. For example, the pronoun in the following Russian example (157) has a non-specific use; the speaker does not have a particular person in mind.

(157) *Ja xoču pogovorit' s kem-nibud' drugim.*
I want talk with someone-NONSPEC other.
'I want to talk to someone else'.

A pronoun has a *specific unknown* use when it refers to a particular object, whose identity is not known to the speaker. A pronoun has a *specific known* use when it refers to a particular object, whose identity is known to the speaker. The difference

can be demonstrated by the following sentences, in which the pronoun corresponding to *someone* has a *specific unknown* use in (158), but *specific known* in (159). As these examples show, while in English the *some-* pronouns are used in all these cases, Russian has a different series for each of these uses.

(158) *Ja s kem-to včera pogovoril, no ne pomnju s kem.*
I with someone-SPEC.UNK yesterday talked, but not remember with who.
'I talked to someone yesterday, but I don't remember who that was'.

(159) *Ja koe s kem včera pogovoil, potom tebe rasskažu.*
I some-KNOWN with who yesterday talked, later you tell-1SG.FUT.
'I talked to someone yesterday, I'll tell you later (who that was)'.

The map represents the environments in such a way that for each indefinite pronoun the environments it appears in are contiguous on the map. For example, the map predicts that it is possible that an indefinite pronoun will occur in all the positions except free choice and the three leftmost positions. Such is, in fact, the English pronoun *ever*. The Russian pronouns of the *-nibud'* series, which occur in all the environments except direct negation, free choice, and the two kinds of specific environments, are also possible, according to the map. On the other hand, the map predicts that there is no indefinite pronoun that can occur in direct negation, indirect negation, free choice, but not in the comparative. Similarly, it is predicted that if a pronoun occurs in the specific use and the free choice, it also occurs in the non-specific use, comparative, and either questions or conditionals. Haspelmath's observations confirm these predictions.

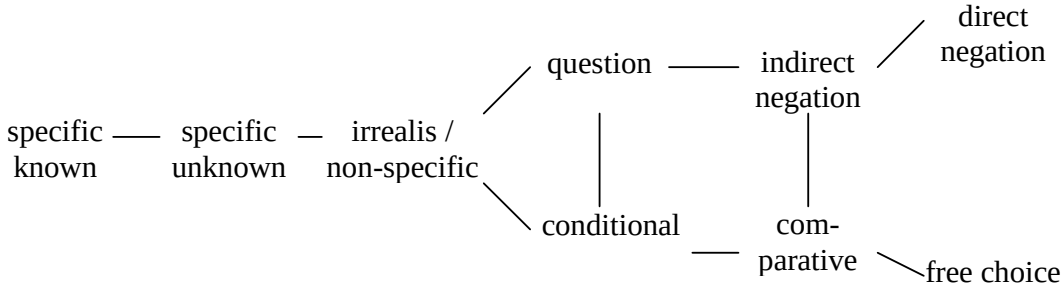

Figure 1: Haspelmath (1997): The semantic map of indefinite pronouns.

The importance of Haspelmath's study is in its empirical coverage: the examination of the indefinite pronouns in the same environments in many languages. Haspelmath's study puts *any* and the pronouns of *any*-series in a cross-linguistic context and shows that the corresponding pronouns in other languages can have very different distributions.

However, the importance to the general study of negative polarity items is more limited. First, Haspelmath does not distinguish between contexts, such as question and conditional, and uses, such as 'free choice' and 'specific unknown'. While environments, such as conditional and question, can potentially license any kind of NPI, free choice and the three left labels are types of usage that can only be applied to indefinite pronouns. Second, many licensing environments, such as the restrictor of the universal quantifier and the second argument of quantifiers like *few*, are not represented in the map. Third, the label 'indirect negation' conflates sentences in which the syntactic negation and the pronoun are in different clauses with sentences in which there is no syntactic negation at all and the pronoun is licensed by a negative predicate. Due to these factors Haspelmath's semantic map is not usually used in the research on negative polarity items.

Giannakidou (1999) examines the distribution of negative polarity indefinite pronouns in Greek. She observes that the pronouns can be used in two ways: in an emphatic form and in a nonemphatic form. The emphatic pronouns are restricted to a small set of environments, while the nonemphatic pronouns appear in a wide variety of environments. The environments in which both types of pronouns appear are: under negation (160), and in the scope of *without* (161) and *before* (162) (Giannakidou 1999:377). In the examples below the nonemphatic pronouns are represented by lowercase, and the emphatic pronouns are represented by uppercase.

(160) O papus dhen idhe kanena/KANENA apo ta agonia tu.
The grandpa not saw any.NONEMPH/any.EMPH from the grandchildren his.
'Grandpa didn't see any of his grandchildren.'

(161) O papus pethane xoris na dhi kanena/KANENA apo ta
The grandpa died without SUBJ see any.NONEMPH/any.EMPH from the
agonia tu.
grandchildren his.
'Grandpa died without seeing any of his grandchildren.'

(162) O papus pethane prin na dhi kanena/KANENA apo ta
The grandpa died before SUBJ see any.NONEMPH/any.EMPH from the
agonia tu.
grandchildren his.
'Grandpa died before seeing any of his grandchildren.'

Nonemphatic pronouns, but not emphatic pronouns, can appear in all the known DE environments, and in addition in non-specific uses such as in the imperative (163), with a disjunction (164) or with the adverb *isos* 'perhaps' (165):

(163) Pijene se kanenan/*KANENAN jatro.
Go.IMP.2SG to any doctor.
'Go to a doctor.'

(164) I bike kanenas/*KANENAS mesa I afisame to fos anameno.
Or entered.3SG anyone in or left.1PL the light lit.
'Either somebody broke into the house or we left the light on.'

(165) Isos na irthe kanenas/*KANENAS.
Perhaps SUBJ came.3SG anybody.
'Maybe somebody came.'

To explain the distribution of these items, Giannakidou formulates the conditions of non-veridicality and anti-veridicality as follows:

(166) Let O(p) be a sentential operator. O is *veridical* iff O(P) => p is logically valid. O is *nonveridical* iff O is not veridical. O is *antiveridical* iff O(p) => ¬p is logically valid.

Giannakidou uses these definitions to formulate the licensing conditions for the two kinds of indefinite pronoun. According to her proposal, non-emphatic pronouns are licensed in nonveridical environments, while the emphatic pronouns are licensed in antiveridical environments. Antiveridicality is a stronger condition than nonveridicality, that is, every anti-veridical environment is also non-veridical. Therefore, every environment that licenses the emphatic pronouns also licenses the nonemphatic pronouns.

All the examples above are non-veridical; this explains the licensing of the nonemphatic pronouns. Negation and *without* always create an anti-veridical environment, which explains the licening of the emphatic pronouns. On the other hand, *before* can sometimes have a different usage, as in the following sentence (Giannakidou 1999:395):

(167) Elenkse tis plirofories prin na agorasi tipota/*TIPOTA.
Checked.3SG the information before SUBJ bought.3SG anything.
'S/he checked the information before s/he bought anything'.

The sentence is either veridical or nonveridical, but not antiveridical. The nonemphatic pronoun is licensed with the nonveridical reading, while the emphatic is not licensed with either reading, since neither of them is antiveridical.

The condition of non-veridicality captures all the environments in Haspelmath's map except the leftmost two; this is an allowed distribution according to the map. While these conditions may be good in describing the distribution of the Greek indefinite pronouns, they are less helpful for the negative polarity items in other languages. The predictions of these conditions for sentences with *almost* and *barely* (section 8.7), *only*, and the emotive factives (section 2.3.2) are contrary to the actual distribution of the NPIs in English. In section 10.3.2 I suggest that replacing veridicality with assertivity, a concept I define in section 6, improves the empirical coverage of the licensing condition.

2.7.3 Inflectional morphology

Although most negative polarity items are standalone words and expressions, the phenomenon of polarity sensitivity has also been observed in inflectional morphology (Levinson 2006). In this section I discuss two categories of morphological markers that become negative polarity items: the partitive case, and the irrealis mood.

A number of languages exhibit differential object case marking. One of the case-marking options, the partitive, signals partial affectedness of the object, while the other option (accusative or absolutive) is used when the object is fully affected. Since a negative sentence denotes an absence of action, the partitive sometimes becomes associated with negation, and with the other NPI-licensing environments.

One of the languages in which this happens is Finnish. Finnish uses partitive and accusative for object case marking. Typically, three rules are given to explain the usage of partitive and accusative (Kiparsky 1998). The first concerns aspectual boundedness: if the eventuality denoted by the verb is atelic, the partitive is used (168); the accusative can only be used with a telic eventuality. Secondly, the partitive is used if an NP denotes an indeterminate quantity (169). Finally, the partitive is obligatory with negation.

(168) Ammu-i-n karhu-a / karhu-n
shoot-Pst-1Sg bear-Part / bear-Acc
'I shot at a/the bear / I shot a/the bear'

(169) saa-n karhu-j-a / karhu-t
get-1Sg bear-Pl-Part / bear-PlAcc
'I'll get (some) bears / the bears'

Kaiser (2002) noticed that in some cases the partitive can be used in questions, but not in affirmative sentences.

(170) Pekka huomasi miehen /*miestä.
Pekka-NOM noticed man-ACC/*man-PRT.
'Pekka noticed a/the man'.

(171) Huomasi-ko Pekka miehen/miestä?

Noticed-Q Pekka-NOM man-ACC/man-PRT.

'Did Pekka notice a/the man?'

However, in addition to the environments discussed by Kaiser, there are other NPI-licensing environments allowing the partitive:

(172) Harva/*moni huomasi miestä. FEW

Few/*many noticed man-PRT.

'Few/many people noticed a/the man'.

(173) Ennenkuin/*Senjälkeen Pekka huomasi miestä… BEFORE

Before /*after Pekka noticed man-PRT

'Before/after Pekka noticed a/the man…'

These examples support Kaiser's (2002) conclusion that the Finnish partitive has an NPI behavior.

Basque is another language is which the partitive becomes a negative polarity item. Basque is an ergative language, so the object of a transitive verb and the subject of an intransitive verb have the same case marking: absolutive. In some cases the otherwise absolutive NP can have a partitive marker. The partitive is not available for ergative case NPs (Ortiz de Urbina 1985). The partitive cannot be used with simple affirmative sentences, but it can be used in many NPI-licensing environments, such as negation, questions and antecedents of conditionals (de Rijk 1972; Laka 1990:37; Hualde and Ortiz de Urbina 2003:124). It can also be used with epistemic modals (Hualde and Ortiz de Urbina 2003:551), similar to the Greek NPIs (Giannakidou 1998).

The most common manifestation of polarity sensitivity in morphology can be found in the category of *reality status* (Elliott 2000). Reality status is usually marked on the verb, with *realis* and *irrealis* as possible values. In some languages the marker of irrealis becomes a negative polarity item. In European languages, the reality status categories are traditionally called *indicative* and *subjunctive*, with subjunctive being used almost exclusively in subordinate clauses. Nathan and Epro (1984:522) noticed

that many of the constructions that trigger NPIs in English also license the subjunctive mood in Romance languages. A similar observation was made by Giannakidou (1995) for Greek and Romanian.

(174) Je crois qu'il est/*soit intelligent. (French)
I believe that he is-IND/*is-SUBJ smart.
'I believe that he is smart'.

(175) Je ne crois pas qu' il soit intelligent.
I NEG believe that he is-SUBJ smart.
'I don't believe that he is smart'.

(176) Crois-tu qu'il soit intelligent?
Believe-you that he is-SUBJ smart.
'Do you believe that he is smart?'

(177) Comimos antes / *después que él llegara. (Spanish)
Ate-1PL before / after that he arrived-SUBJ.
'We ate before/after he arrived'.

(178) Dudo que sea francés.
doubt-1SG that is-3SG-SUBJ French.
'I doubt that he/she is French'.

(179) Me alegra que sepas la verdad.
me pleases that know.2SG.SUBJ the truth
'I'm glad you know the truth'.

Unlike the European languages, many languages of the world have the realis/irrealis distinction in main clauses as well. The exact distribution of the realis/irrealis marking varies widely across languages (Mithun 1999; Bybee 1998; Elliott 2000). Simple past and present are always realis (Palmer 2001:168), while the typical use of irrealis is to denote possible events. Other environments that can license irrealis include negation, questions, future and imperatives. Here are some examples

of environments in which the irrealis marking occurs in Caddo, a Native American language spoken in Oklahoma (Chafe 1995; Melnar 2004):

(180) sah?-yi=bahw-nah YES-NO QUESTION

2ND.AGENT.IRREALIS-see-PERFECT

'Have you seen him?'

(181) kúy-t'a-yi=bahw NEGATION

NEG-1ST.AGENT.IRREALIS-see

'I don't see him'

(182) kas-sa-náy=?aw OBLIGATION

OBLIGATIVE-3RD.AGENT.IRREALIS-sing

'He should/is supposed to sing'.

(183) hí-t'a-yi=bahw ANTECEDENT OF A CONDITIONAL

CONDITIONAL-1ST.AGENT.IRREALIS-see

'If I see it'

(184) wás-t'a-yi=bahw INFREQUENTATIVE ADVERB

INFREQUENTATIVE-1ST.AGENT.IRREALIS-see

'I seldom see it'

(185) hús-ba-?a=sa-yi=k'awih-sa?

ADMIRATIVE-1ST.BENEFICIARY.IRREALIS-name-know-PROGRESSIVE

'Surprisingly, he knows my name'

The licensing of subjunctive in the complements of emotive factives (179), and the use of irrealis with the admirative prefix *hús-* in Caddo, expressing surprise (185), is not expected according to the usual definitions of the realis/irrealis distinction. This is expected in the context of NPI-licensing, since the NPIs are known to be licensed by emotive factives.

The influence of negation on the use of markers of different grammatical categories has been the subject of typological research. Aikhenvald and Dixon (1998)

explore the dependency of markers of tense, aspect, evidentiality, person, number, and case on the polarity of the sentence. Miestamo (2005) examines the usage of markers of finiteness, reality status, tense, aspect, modality and agreement in positive and negative sentences. Only the standard negation is examined in these studies; it is not known to what extent the dependencies they observe hold for other NPI-licensing environments.

2.7.4 Minimizers and maximizers

Minimizing phrases, such as *(not) sleep a wink* (186) and *(not) budge an inch* (188), have been the subject of the NPI-licensing research since its early stages (Schmerling 1971). Minimizers are a productive class of negative polarity items, and they have been observed in many languages (Horn 1989:452).

(186) I didn't *sleep a wink.*

(187) We are not *the least bit* amused.

(188) She didn't *budge an inch.*

Israel (1995) examines the distribution of the minimizing phrases and discusses a number of environments in which their distribution differs from that of indefinites like *any*. One such case involves negative sentences with *because*-clauses. While negation licenses both minimizers (190) and indefinites (189), negative *because* sentences allow indefinites (191), but not minimizers (192).

(189) Zelda didn't drink *any* vodka.

(190) Zelda didn't drink *a drop* of vodka.

(191) Zelda didn't fall asleep because she drank *any* vodka. She was just very tired.

(192) *Zelda didn't fall asleep because she drank *a drop of* vodka. She was just very tired.

Another case involves restrictors of quantifiers. Indefinites like *any* are licensed in the restrictor of quantifiers like *few* whether there is a clear causal connection between the restrictor and the claim (193) or such a connection is absent (194). This is not the

case with the minimizers. When the causal connection is clear, the minimizers are licensed (195). When such connection is not evident, the minimizers are not allowed (196).

(193) Few of the guests who ate *any* trout enjoyed the meal.

(194) Few of the guests who ate *any* trout dressed well.

(195) Few of the guests who ate *a bite of* trout enjoyed the meal.

(196) *Few of the guests who ate *a bite of* trout dressed well.

The explanation proposed by Israel distinguishes between downward monotonicity and reversal of entailment scales. According to his explanation, the environments above are downward monotone, and this is the reason why *any* is licensed. Minimizers need more that downward monotonicity: they require that a salient entailment scale be present. This is not the case with negative *because* sentences and with quantifier restrictors when there is no causal connection between the restrictor and the claim, therefore the minimizers are not licensed in these environments.

Israel (1996) notes that sentences with minimizers express strong claims, which entail the claims with other possible measure phrases. For example, *she didn't sleep a wink* entails *she didn't sleep five minutes*. He calls such expressions *emphatic NPIs*. The minimizers are contrasted with another class of negative polarity items, demonstrated below (Israel 1996:626):

(197) She didn't sleep *much*.

(198) He's not *all that* clever.

(199) This won't take *long*.

While the minimizers denote low values, the NPIs of this class denote high value. Unlike sentences with minimizers, sentences with these NPIs denote weak claims, which are in fact entailed by most comparable claims. For example, *she didn't sleep much* is entailed by *she didn't sleep five minutes*. In Israel's terminology, such NPIs express an *understatement*, creating a weaker claim than the one that the speaker intends to convey.

Israel (1996) analyzes the difference between the two classes of the NPIs in terms of what he calls *q-value* and *i-value*. The first notion, q-value (quantitative value), is the value on the scale denoted by the item. The minimizers have a low q-value and the NPIs such as *much* (197) and *all that* (198) have a high q-value. The *i-value* is the informational value of the sentence. The i-value of emphatic sentences is high and the i-value of understatement sentences is low. Since negation reverses the entailment scales, a low q-value NPI creates a sentence that entails the other sentences on the scale. Such a sentence has a high i-value, and such NPIs are emphatic. On the other hand, the high q-value NPIs create sentences which are entailed by the other sentences on the scale, so this NPIs have a low i-value, that is, they express understatements.

Since the scale in negative sentences is reversed compared to that in affirmative sentences, a mirror picture is observed with PPIs (positive polarity items). Low q-value PPIs have a low i-value, that is, they express an understatement. Examples of such PPIs are *sorta* (200) and *a little bit* (201). On the other hand, high q-value PPIs have a high i-value, they are emphatic. Examples of such PPIs are *as … as hell* (202) and *scads of* (203).

(200) Maggie was *sorta* rude to the secretary.

(201) Belinda won *a little bit* of money at the Blackjack tables.

(202) Bert was *as rude as hell* to Ernie.

(203) Belinda won *scads of* money at the Blackjack tables.

Israel (2001:312) examines some NPIs that do not fit the generalizations above. For example, the following NPIs are emphatic (high i-value), and they denote high quantities. This is not what is expected according to the explanation based on entailment scales.

(204) *Wild horses* couldn't/*could keep me away.

(205) I wouldn't do it *for all the tea in China*.

(206) I wouldn't touch it *with a ten-foot pole*.

Similarly, there are some emphatic PPIs denoting small quantities:

(207) We'll be back in *a jiffy*.

(208) I would do it again *in a heartbeat*.

According to Israel, the difference between the inverted NPIs and the regular NPIs is in the participant roles. The regular NPIs denote roles such as patient or theme, that denote the effect of the action. For such roles, the regular entailment scales in affirmative sentences are from high to low quantity. The scale is reversed in negation, and the low quantity statement becomes the strongest:

(209) I have *ten dollars* ⇒ I have *five dollars*.

(210) I don't have *ten dollars* ⇐ I don't have *five dollars*.

The opposite is true for the inverted NPIs. Such NPIs occur in expressions denoting resources required for the action, or other kinds of conditions for actions. For such roles, the regular entailment scale is from low to high quantity, and in the reversed scale the high quantity statement becomes the strongest:

(211) I can eat an apple *in five minutes* ⇐ I can eat an apple *in one minute*.

(212) I can't eat an apple *in five minutes* ⇒ I can't eat an apple *in one minute*.

The conclusion is that both regular and inverted emphatic NPIs denote quantities that make the strongest claim on the reversed entailment scale. In patient/theme participant roles, such a claim on a scale with negation is obtained with the lowest quantity, and in "resource" participant roles, such a claim is made with the highest quantity phrase.

2.7.5 Conclusion

We have seen a number of studies focused on particular classes of negative polarity items. Each class of negative polarity items, while sharing some distributional properties with the other classes, also has its own particular behavior. The indefinites show an interaction of distribution and interpretation. The morphological NPIs are rare, have a more limited distribution, and are not accompanied by the emphatic feeling. The minimizers and maximizers have a more limited distribution than

indefinites, and show a dependence of polarity sensitivity on the participant role denoted by the item.

This dissertation contributes to this line of research: an in-depth investigation of the particular licensing conditions for different types of negative polarity items. I identify a class of negative polarity items that did not receive close attention in the literature, and examine their distribution. Then I propose a new licensing condition, combining downward entailment with an additional requirement.

3 The Negative Polarity Particles in English

3.1 Introduction

In this study I discuss a class of negative polarity items that I call *negative polarity particles* (NPPs). I use this term do refer to two classes of negative polarity items: negative clausal particles and negative aspectual particles. All the NPPs have positive polarity counterparts. The English negative polarity particles to be discussed in this study are:

- Negative clausal additive particle *either*. Its positive counterpart is *too*:

(213) He didn't like me and I didn't like him *either*.

(214) He liked me and I liked him *too*.

- Negative clausal additive particle *neither*. Its positive counterpart is *so*:

(215) You don't work for free, and *neither* do I.

(216) You work for free, and *so* do I.

- Aspectual discontinuative particle *anymore*. Its positive counterpart is *still*:

(217) I don’t work there *anymore*.

(218) I *still* work there.

- Negative continuative particle *yet*. Its positive counterpart is *already*:

(219) This album is not reviewed *yet*.

(220) This album is *already* reviewed.

Most of this study discusses negative polarity particles in English. Some NPPs in languages other than English are discussed in Section 11 below. These include:

- Aspectual discontinuative particles in Russian and German.
- Negative clausal additive particles in Spanish and French.
- Negative clausal contrastive particles in Spanish, French and Catalan.

In the rest of this section I introduce the English negative polarity particles, demonstrate their sensitivity to negative polarity, discuss their semantics, and show the similarity between the clausal particles and the aspectual particles.

3.2 Negative additive focus particle: *either*.

The additive particles *too* and *either* denote the existence of an additivity relationship between two clauses[6]. I will call the clause in which the particles appear *the host clause*, and the earlier clause to which the particle refers *the antecedent clause*.

In the typical usage of *either* both the host clause and the antecedent clause are syntactically negative. When both clauses are positive, the sentence is ungrammatical:

(221) He didn't like me and I didn't like him *either*.

(222) *He liked me and I liked him *either*.

(McCawley 1988:582; Rullmann 2003:337).

It might seem at the first glance that *either* must coordinate two negative clauses. However, the status of the antecedent clause and the host clause is not the same. The surface negativity requirement only applies to the host clause, while the antecedent clause must entail a relevant negative proposition, but it does not necessarily have to be negative itself:

(223) a. I like pizza, and I like spaghetti *too*/**either*.

---

[6] In this thesis I only discuss the usage of *either* as a sentence final particle, as demonstrated in the examples in this section. The word *either* has at least two other usages, one as marking a disjunction (i), and another as a determiner (ii):

(i) We're *either* going to LA or to New York.

(ii) We are not going to *either* city.

The usage of *either* as a disjunction is not polarity sensitive (see (Schwarz 1999; Hendriks 2004) and the references there for a discussion of this usage). The usage of *either* as a determiner seems to behave similar to *any*. They will not be discussed in this study. The diachronical connection between the three usages of *either* and the development of the current distribution pattern of the additive particle *either* are discussed in (Rullmann 2002).

b. I don’t like pizza, and I don’t like spaghetti *either*.

c. I don’t like pizza, and I hate spaghetti *too*/**either*.

d. I hate pizza, and I don’t like spaghetti *either*.

In the following sentence the antecedent clause is clearly not negative in any way. The usage of *either* is grammatical, since the antecedent clause entails “the men don’t hate you”, which is similar to the host clause.

(224) All the men fall in love with you, and the women don't hate you for it, *either*.

Although there are limitations on the form of a host clause than can license *either*, the host clause does not have to be syntactically negative. The following sentences (taken from Rullmann 2003:345-347) contain *either* in an environment that does not have syntactic negation:

(225) Few Americans have ever been to Spain. Few Canadians have, *either*.

(226) It appears that Botha has little respect for Lewis, *either*.

(227) Publishers will usually reject suggestions, and writers will scarcely/hardly/never/seldom/rarely accept them, *either*.

(228) It’s unlikely that John will come *either*.

(229) I doubt he can move to the house, *either*.

For the time being, I will call the environments such as (225) - (229) simply *negative*. This reflects the intuition that there is something negative in the sentences above, although they are not syntactically negative. The notion of negativity required to license the negative polarity particles is explicated later in this study as *semantic negativity*.

It is worth noting that *either* can also be used with VP-deletion in the host clause. In this case it is the antecedent clause that has to be negative:

(230) The men don’t hate you for it, and the women don't, *either*.

(231) *All the men fall in love with you, and the women don't, *either*.

Particles similar to English *either* exist in French *(non plus)*, Spanish *(tampoco)*, and in other Romance languages. The French and the Spanish negative additive particles are discussed in section 11.2.

The particles *too* and *either* belong to a larger class of what König (1991) calls 'focus particles'. In addition to *too* and *either*, this class includes particles such as *even*, *only*, and others. The naming of the various subvarieties of focus classes can vary across studies. König calls particles like *too* 'simple inclusion', or simply *additive*. The particle *even* is called a *scalar additive particle* (Schwarz 2005) . On the other hand, other studies (Krifka 1998) use the term *additive particles* in a way that excludes *even*, which is called simply *a scalar particle*. In this study I do not discuss scalar (scalar additive) particles like *even*, concentrating on the 'simple inclusion' additive particles.

3.3 Negative additive focus particle: *neither*

Another particle discussed in this work is *neither*. In typical usage, *neither* is used when two clauses are combined, and it introduces VP-deletion in the host clause. The antecedent clause is usually syntactically negative. The positive counterpart of *neither* is *so*.

(232) You don't work for free, and *neither* do I.

(233) You work for free, and *so*/**neither* do I.

Klima (1964) noticed that the antecedent clause does not have to be syntactically negative for the sentence with *neither* to be grammatical. For example, the following sentences with *neither* do not contain an overt negation:

(234) Writers will <u>seldom</u> accept suggestions, and *neither* will publishers.

(235) I <u>doubt</u> that you think so, and *neither* do I. [= I don't think so]

(236) But my son, who was about 4 at the time, was <u>too</u> young <u>to</u> care and *neither* did his playmates. [=they didn't care]

The sentence with *neither* can frequently be paraphrased by a sentence with *either* and overt negation. In this case the host clause of *either* has VP-ellipsis.

(237) Paul doesn’t smoke, and *neither* do I.

(238) Paul doesn't smoke, and I don't *either*.

As noticed above, the validity of the usage of *either* with VP-ellipsis depends on the negativity of the antecedent clause. This is similar to *neither* and unlike the regular *either*, whose usage depends on the negativity of the host clause.

In order to compare the particles discussed thus far with those discussed later it may be helpful to summarize them in the following table:

current clause previous clause	positive	negative
positive	*too, so*	–
negative	–	*either, neither*

Table 1. Positive and negative additive particles.

This table arranges the particles in a form convenient for comparison, and this necessitates some simplification. The label ‘positive’ mean that the clause is usually positive (not negative); *too* can sometimes coordinate negative clauses. The label ‘negative’ means either that the clause must be negative, in the sense defined above, or that the clause must entail a relevant negative proposition. The former holds, for example, for the host clause of *either* without VP-ellipsis, and for the antecedent clause of *either* and *neither* with VP-ellipsis. The latter condition holds for the antecedent clause of *either* without VP-ellipsis. This distinction is not represented in the table.

The positive additive particles usually combine two clauses which are both positive. Negative additive polarity particles usually combine two negative clauses. We will see other combinations later in this study.

3.4 Negative Aspectual particles: *yet, anymore*

The negative polarity particles *either* and *neither* discussed above are both additive particles. Another kind of particles discussed in this thesis are negative aspectual

particles *yet* and *anymore*. The corresponding positive particles are *already* and *still*, respectively.

Both *yet* and *anymore* are usually used in syntactically negative sentences:

(239) This album is not reviewed *yet*.

(240) This album is *already* reviewed / *This album is reviewed *yet*.

(241) I don't work there *anymore*.

(242) I *still* work there / *I work there *anymore*.

Like *either* and *neither*, *yet* and *anymore* do not strictly require syntactic negation. Some sentences, negative in the sense defined earlier, allow *yet* and *anymore* in the absence of syntactic negation:

(243) They barely talk *anymore*

(244) Few tourists are here *yet*.

(245) They've had to reduce the player caps repeatedly, but they have refused to admit it *yet*.

(246) He was too young to understand it *yet*.

Although *yet* and *anymore* are well known negative polarity items, they have not received much attention in the NPI literature. The word *anymore* is more widely known for another usage of it, called 'positive *anymore*', occurring in some nonstandard dialects of English in the Midwestern US (Labov 1972; Hindle and Sag 1975; Labov 1991; Murray 1993; Labov 1996) and in some areas of Canada, Scotland and Ireland (Haycock 2000). In this usage *anymore* means 'nowadays':

(247) Everybody drives a car *anymore*. (Haycock 2000)

(248) Cod are scarce *anymore*. (Haycock 2000)

(249) I always use coupons *anymore* when I shop. (Murray 1993)

In this thesis I do not discuss this colloquial positive *anymore*, concentrating on the NPI *anymore* of Standard English. I do mention this usage in some ambiguous

cases, in which it is not clear whether the given occurrence of *anymore* should have the positive or the NPI interpretation.

3.5 Unified semantics for the negative polarity particles

It might seem that the aspectual particles *yet* and *anymore* have little in common with the additive particles *either* and *neither*. In this section I would like to show that the aspectual particles and the additive particles do form a natural class. One common analysis of the aspectual particles *still, anymore, already, yet* sees these particles as expressing contrast or additivity between the current state referred to in the clause and some earlier state. This analysis is known as "Löbner's square" of the aspectual particles (Löbner 1989, 1999).

According to this analysis, the aspectual particles *yet, already, still* and *anymore* combine an *assertion* regarding the reference time in the sentence (t_a) with a *presupposition* regarding an earlier moment (t_{ep}). The difference between the particles is in the positivity and negativity of the assertion and the presupposition. The continuative particle *still* expresses a positive assertion and a positive presupposition, while *anymore* expresses a negative assertion and a positive presupposition. For example, (250) asserts that the light is on in the present (a positive assertion), and presupposes that the light was on in some earlier time (a positive presupposition). On the other hand (251) asserts that the car is not here in the present (a negative assertion), and presupposes that it was here in some earlier time (a positive presupposition).

(250) The light is *still* on.

(251) My car is not here *anymore*.

We see that *still* and *anymore* have the same positive presupposition: that the predicate they are used with was true for t_{ep}. The difference is that the assertion of *still* is positive, and that of *anymore* is negative.

The other two aspectual particles, *yet* and *already*, share a negative presupposition: that the predicate was false for t_{ep}. The difference is in the assertion: *yet* is used with a

negative assertion, and *already* is used with a positive assertion. Consider the following sentences:

(252) My car is not here *yet*.

(253) My car is *already* here.

Both sentences have a negative presupposition, namely, that my car was not here in t_{ep}. The sentence with *yet* has a negative assertion, that my car is not here in the present, while the sentence with *already* has a positive assertion, that it is here.

The presuppositions and the assertions of the aspectual particles can be summarized in the following table[7]. The last column of the table shows whether the particle expresses additivity or contrast. If the presupposition and the assertion are of the same polarity, that is, both are positive or both are negative, the particle denotes additivity. If the presupposition and the assertion are of different polarity, that is, one is positive and the other is negative, the particle denotes contrast.

Aspectual expression	Presupposition	Assertion	Additivity/contrast
already P	$\neg P(t_{ep})$	$P(t_a)$	contrast
yet P	$\neg P(t_{ep})$	$\neg P(t_a)$	additivity
still P	$P(t_{ep})$	$P(t_a)$	addivitity
anymore P	$P(t_{ep})$	$\neg P(t_a)$	contrast

Table 2. Presuppositions and assertions of expressions with aspectual particles

The particles are usually represented in the following form, known as Löbner's square:

[7] In this table and discussion I only examine simple positive and negative sentences, with negation as the only licensor of the negative polarity particles.

current state / previous state	positive	negative
positive	positive continuative: *still*	positive/negative contrast (discontinuative): *anymore*
negative	negative/positive contrast: *already*	negative continuative: *yet*

Table 3. Löbner's square.

We can see the similarity of these tables to Table 1 above. The two continuative aspectual particles *still* and *yet* denote additivity between the previous state and the current state. The function of the additive particles, such as *too,* is to denote additivity between two clauses. Therefore, the continuative aspectual particles and the additive particles *either*/*neither* denote additivity in different domains: the additive particles *so*, *too*, *either*, *neither* express relations between two related clauses, and the aspectual particles express relations between two temporal states. To avoid confusion, from now on I will call the former *clausal additive particles*.

The parallels between the individual particles are as follows. The additive particle *too* is used with a positive host clause and a positive antecedent clause. The continuative aspectual particle *still* is used with a positive assertion regarding the assertion time and a positive presupposition regarding an earlier time. The positive additivity in the clausal domain is expressed with *too,* while the positive additivity in the temporal domain is expressed with *still*.

(254) He liked me and I liked him *too.*

(255) The light is *still* on.

A similar parallel holds for the particles expressing negative additivity. The additive particle *either* is typically used with a negative host clause and a negative antecedent clause. The negative continuative particle *yet* is used with a negative assertion regarding the assertion time and a negative assertion regarding an earlier

time. The negative additivity in the clausal domain is expressed with *either*, while the negative additivity in the temporal domain is expressed with *yet*.

(256) He didn't like me and I didn't like him *either*.

(257) My car is not here *yet*.

The other two aspectual particles in Löbner's square, *already* and *anymore*, do not denote additivity. Instead, they denote contrast between the previous and the current state. The discontinuative *anymore* denotes contrast between the positive previous state and the negative current state; the particle *already* denotes a reverse case, a contrast between a negative previous state and a positive current state. Although we have not yet seen such particles in the clausal domain, they do exist in Spanish and other languages, and will be discussed later in section 11.4.

There is another difference between the aspectual particles and *either/neither*. While with *either/neither* both the antecedent clause and the host clause are usually present, the previous state is usually only implied when an aspectual particle is used. The negativity requirement for aspectual particles, unsurprisingly, involves the host clause, that is, the clause in which the particle occurs.

Therefore, all the particles mentioned thus far can be summarized in Table 4 below. Both the negative polarity particles and their positive counterparts are listed.

current polarity previous polarity	positive	negative
positive	positive additivity: *too, so, still*	positive/negative contrast *anymore*
negative	negative/positive contrast *already*	negative additivity *either, neither, yet*

Table 4. The English particles discussed in this thesis

An interesting fact supports this analysis: German *schon* 'already', whose main meaning is an aspectual particle denoting a negative-to-positive temporal contrast, can also be used with VP-ellipsis denoting negative-to-positive sentential contrast:

(258) Jarre mag die Aufnahme nicht, ich aber schon.
Jarre likes the recording not I however already
'Jarre doesn't like the recording, but I do.'

Therefore, the negative polarity particles are negative polarity items denoting a relation of additivity or contrast between the asserted clause and a presupposed clause or event. In this respect the NPPs differ from the typical negative polarity items. The typical negative polarity items are words and phrases denoting extreme degrees, minimum or maximum quantities, as the following examples demonstrate:

(259) Zelda didn't drink *any* vodka.

(260) Zelda didn't drink *a drop* of vodka.

(261) She didn't sleep *much*.

Like other phrases of their syntactic categories, the typical negative polarity items contribute to the assertion of the sentence. On the other hand, the negative polarity particles do not denote an extreme degree and do not affect the assertion of the sentence. Therefore, the typical motivation for downward monotonicity as a licensing condition of negative polarity items does not apply to the negative polarity particles. After examining the distribution of the NPPs and proposing a licensing condition in the following chapters, a possible explanation for the licensing condition is outlined in section 9.4.

We have seen that the negative polarity particles discussed in this section can also be licensed in sentences that are not syntactically negative. What exactly are the environments in which these particles can be used? In Section 4 I survey the known NPI-licensing environments and examine the behavior of the NPPs in these environments.

4 The Distribution of Negative Polarity Particles

4.1 Introduction

We have seen above that syntactic negation is not the only environment in which the negative polarity particles are used. My goal in this section is to investigate and describe the distribution of the negative polarity particles. All the environments in which the NPPs occur are known in the semantic literature to be *NPI-licensing*. By NPI-licensing environments I mean such environments that license NPIs like *any* and *ever*. This term is not intended to mean that such environments license *all* the NPIs; this just means they can license *some* NPIs, usually including *any* and *ever*.

However, the NPPs do not occur in all the NPI-licensing environments. In this section I examine the known NPI-licensing environments and check which of them license the NPPs.

The conclusion that is reached is that the NPPs are licensed in a subset of NPI-licensing environments. To the extent that the NPI-licensing environments are downward monotone, it can be said that the NPPs are licensed in a subset of downward monotone environments.

4.2 The licensing environments

The following NPI-licensing environments license the NPPs:

- Negation

As we have seen above, the NPPs can be licensed by a syntactic sentential negation, and, indeed, this is their most frequent use. For convenience, some examples are repeated below:

(262) This album is not reviewed *yet*.

(263) I don’t work there *anymore*.

(264) He didn't like me and I didn't like him *either*.

(265) You don't work for free, and *neither* do I.

- Scope of *few* and *rarely*

The meaning the words *few* and *rarely* introduce can be informally expressed as "less than a certain implicit standard"[8]. That is, (266) means that the number of people here is less than expected, and (267) means that the frequency of my visits is less that a certain level expected for that kind of a store.

(266) There are *few* people here.

(267) I *rarely* go to that store.

Examples of NPPs licensed by *few*:

(268) Few Americans have ever been to Spain. Few Canadians have, *either*.

(269) Few farmers trade and *neither* do most governments, unless they have a state trading entity.

(270) Few/*many tourists are here *yet*.

(271) I trust very few people *anymore*.

Examples of NPPs licensed by *rarely:*

(272) While he rarely grew angry, he rarely joked, *either*.

(273) Their seafood dishes rarely disappoint, and *neither* do their pizzas.

(274) That has rarely happened *yet*, but it's going to happen at lot.

(275) It is rarely seen *anymore*.

- Negative implicative verbs

Verbs with clausal complements can be classified according to their *implicativity*, a notion that was introduced in the linguistic literature by Karttunen (1971a; 1971b), and recently generalized by Nairn et al. (2006). Adopting the terminology of

[8] In Jespersen's (1917) formulation, these words express "approximate negation".

Nairn et al. (2006), a verb F is *positive implicative* iff F(p) => p and *negative implicative*[9] iff F(p) ⇒ ¬p. For example:

(276) I forgot to have lunch.

=>

I didn't have lunch.

(277) I refused to sign the contract

=>

I didn't sign the contract.

Therefore, the verbs *forget* and *refuse* are negative implicative.

The negative polarity particles can be licensed by these verbs, although there is some variation among the verbs with this respect:

Examples of NPPs with *prevent*:

(278) That was one mistake Anton never made, and he often prevented her from making it, *either*.

(279) Not only did the Home Office fail to do this, but they have assiduously prevented anyone else from doing it *either*.

[9] In Karttunen's (1971a) terminology, a verb is negative implicative iff both (a) F(p) => ¬p (my definition of negative implicativity) and (b) not F(p) =>p. If the second condition does not hold, the verb is classified as a 'negative *if*-verb'. Nairn et al. (2006) call verbs of both kinds *negative implicative*. Those verbs that satisfy (b) are called *negative two-way implicatives* and those that do not are called *negative one-way +implicatives*. The former class includes the verbs *forget (to), fail, neglect, decline, avoid, refrain*, while the verbs *prevent, discourage, dissuade, keep (from), refuse* belong to the latter class.

The entailments of not F(p) are not relevant for my purposes, so I will use the term *negative implicative* to denote verbs of both these classes, namely verbs for which (a) holds regardless of whether (b) holds or not.

(280) Steady, cold temperatures have prevented me from doing any serious planting *yet*.

(281) Lack of manpower has prevented this from finishing *yet*.

(282) I don't know if it is effective or not but it has prevented mites from entering my apt *anymore*.

Examples of NPPs with *forget*:

(283) I am casein-free, but I forget to mention it *anymore*.

Examples of NPPs with *refuse*:

(284) They've had to reduce the player caps repeatedly, but they have refused to admit it *yet*.

(285) So he wrote to them, that since they refused to accept the cheques back and that I refused to accept it *either*, that he will keep it since he cannot throw it away.

(286) There he was, leading the glam life, but his victims refused to accept defeat, and *neither* did the authorities.

(287) She refused to slow up, and *neither* did her hardship. (Collier-Thomas and Franklin 2001:164)

Green (1973:239) hypothesized that *either* is not licensed by *refuse*, supporting her opinion by (288) (the judgment is hers). It seems that more context is required for the sentences to be acceptable.

(288) *Mary refused to leave *either*.

- Negative implicative constructions: *without, too* Adj *to* V-inf.

The licensors in this category include two constructions of the kind I will call *negative implicative construction*. Similar to the definition of negative implicative verbs, a construction F(p) is *negative implicative* if F(p) => ¬p. Both constructions have positive counterparts, and the negative variants can be seen as incorporating negation.

One negative implicative constructions is the construction of *excess* "*too* Adj *to* V-inf" as in the following sentences:

(289) The sample size was too small to produce accurate results.

(290) He protested too much to be sincere. (Quirk et al. 1985:1140)

The first sentence implies that accurate results were not produced. The second sentence implies that the person referred to was not sincere. However, as noted in an early study by Nelson (1980), a negative implication of this kind does not always hold. For example, (291) does not imply that it is impossible that the speaker watches cartoons, but rather that this is somehow improper.

(291) I am too old to watch cartoons.

Sometimes, two interpretations are possible for one sentence as in the following case (Humberstone and Cappelen 2006:295):

(292) He is too sick to eat.

This sentence can be understood either as "he is so sick that he is not able to eat", which is the negative implicative interpretation, or as "he is so sick that he shouldn't eat", which does not have the negative implication "he doesn't eat".

The different interpretations are explained by (Humberstone and Cappelen 2006) in terms of modality, and similar approach is adopted in other studies of this construction (Meier 2003; Hacquard 2005). Part of the meaning of a construction "too X to Y" is "cannot Y", that is, the modal impossibility of Y is entailed. However, this impossibility has to be interpreted according to a modal base (Kratzer 1977, 1981). If this modal base refers to physical possibility and impossibility, the construction of excess is negative implicative. This is the case with examples (289) - (290) and the first interpretation of (292). Humberstone and Cappelen call this modality *dynatic* (p. 299), and it is sometimes known as physical modality. In the second interpretation of (292), the modality is deontic. In all the worlds in the deontic modal base, worlds in which what "should be" holds, "he does not eat" holds, but our world is not necessarily one of these worlds. Other modalities, such as epistemic, can also be used.

Therefore, the excess construction is negative implicative if the intended modality is the physical. The negative polarity particles are licensed by the excess construction:

(293) … I had a last minute obligation and missed the season opener. Too late to Tivo it *either*.

(294) But my son, who was about 4 at the time, was too young to care and *neither* did his playmates.

(295) He was too young to understand it *yet*.

(296) I was too scared to hitchhike *anymore*.

Another negative implicative construction is *without* + clause/VP phrase, as in the following sentence:

(297) The officers entered *without knocking*.

The negative implicativity is demonstrated by the fact that (297) entails (298):

(298) The officers didn't knock.

The NPPs are licensed in a *without*-clause:

(299) I criticize someone at least once a day without realizing it and I am sure others have without realizing it *either*.

(300) Leuchter has just ruined his life, without knowing it *yet*.

(301) I don't know how to cook food without burning it *anymore*.

- *doubt*

The verb *doubt* is a special case. On the one hand, it is a clausal-complement verb, similar to the negative implicative verbs. On the other hand, it is similar in a certain aspect to the words *few* and *rarely*, since it expresses a level of epistemic attitude less than a certain standard. The NPPs can be licensed by *doubt*:

(302) It didn't rain yesterday, and I doubt it will rain today, *either*.

(303) Fred doubted that Ethel would show up *either*. (Green 1973:238)

(304) I doubt my brother plays cards, and *neither* does my sister. [=play cards]

(305) I doubt whether everything is fixed *yet*.

(306) I very much doubt he is finished playing his games *yet*. (Burke 2004:170)

(307) I doubt anyone cares *anymore*.

(308) I doubt he is my friend *anymore*.

- Questions

The NPIs *any* and *ever* are licensed in questions: (van Rooy 2003)

(309) Have you *ever* been to China?

(310) Do you have *any* potatoes?

In many cases, the negative polarity items in questions are said to introduce a *negative bias*, that is, an implication that the answer to the question is negative. Some NPIs are only allowed if the question is rhetorical (Borkin 1971):

(311) Who *lifted a finger* to help when I needed it?

The NPPs are also licensed in questions:

(312) Have we reached the bottom *yet*?

(313) Do you smoke *anymore*?

Many examples of *either* licensed in direct (314) and indirect (315) questions are given by Rullmann (2003:347). As he notices, these are mostly rhetorical questions which do not expect the hearer to answer, but instead suggest that the answer is no.

(314) While we cannot afford to have any more underground raves, how can we afford to have the above ground ones *either*?

(315) Leo won't show up and I wonder whether Edna will show up *either*.

The NPP *neither* is licensed by an interrogative antecedent clause if the host clause and the antecedent clause are in separate sentences (317). The coordination of an interrogative antecedent clause and the assertion host clause (316) is not grammatical for syntactic reasons.

(316) *Did you understand that, and *neither* did I.

(317) Did you understand that? *Neither* did I.

4.3 NPI-licensing environments that do not license the NPPs.

In this section I discuss some environments that are considered NPI-licensing (they license *any* and *ever*), but do not license the NPPs. The non-licensing of *either* in most of these environments was noticed by Rullmann (2003).

- Antecedents of conditionals

Antecedents of conditionals usually license the NPIs *any* and *ever*.

(318) If you *ever* go to Brussels, you should buy me some Belgian chocolates.

(319) If you see *any* typos on my blog, please do scream at me.

However, the NPPs are not licensed by being in the antecedent of the conditional:

(320) I have never been to Amsterdam.*If I go to Brussels *either*, I will buy you some Belgian chocolates.

(321) *If you have been to Amsterdam, you probably visited the Rijksmuseum, and *neither* have I.

(322) *If you work there *anymore*, leave.

The sentences with the corresponging positive particles are grammatical:

(323) If you still work there, leave.

(324) If you've already got iTunes, just click here.

(325) ?If you've got iTunes *yet*, just click here.

There is a particular kind of conditional that does license the NPPs. These are of the form "I'll be / I'm damned/darned/blowed/dashed if…":

(326) We never even used the 10.0 disk, and I'll be damned if I will use it now *either*.

(327) What appears to be the final ending is unrealistic. Or is it meant to be a delusional fantasy a la Norma Desmond in Sunset Boulevard? I'll be damned if I know. And *neither* did any of several people whom I discussed the matter with after the final curtain. [http://www.talkinbroadway.com/regional/nj/nj7.html]

(328) Ever since the first year in college, I thought I could throw 90 meters (295-3) no problem. I'll be damned if I've done it *yet*. I know I can do it. [http://www.usatoday.com/sports/olympics/athens/track/2004-08-25-greer-profile_x.htm]

(329) I studied Japanese for 3.5 years but I'll be damned if I can remember it *anymore*.

In this case the conditional functions as a negative implicative construction (Veltman 1986:162; Declerck and Reed 2001:9.2.7.1), and this is the reason the NPPs are licensed.

- Restrictor of universals and some other quantifiers

  The NPIs *any* and *ever* are licensed in the restrictor position of universals and some other quantifiers:

(330) Everyone who has *ever* lived in Charlottesville has played a role in its ongoing story.

(331) Most physicians who treat *any* Medicaid beneficiaries see relatively few of them.

The NPPs are not licensed in these environments:

(332) No one of us has ever been to Amsterdam. *Everyone/*No one who has been to Brussels *either* wants to go there again some day.

(333) *Everyone who lives in San Francisco heard about it, and *neither* did I.

(334) *Everyone who saw the movie *yet* liked it.

(335) *Everyone who is here *anymore* will receive a prize.

- Comparative clauses

  The NPIs *any* and *ever* are licensed in comparatives (Zepter 2003):

(336) I feel better than I have *ever* felt before.

(337) Hubi is taller than *any* student is. (Zepter 2003:196)

As a rule, the NPPs are not licensed in these environments[10]:

(338) *I feel better than I have ever felt before *either*.

(339) *I like walking more than running, and *neither* do you.

(340) *Hubi is taller than any student is *anymore*.

- Complements of emotive factives

The NPIs *ever* and *any* are licensed with emotive factives that express negative emotional or epistemic attitude (Klima 1964:314):

(341) I regret that I *ever* went to Spain.

(342) I am surprised that he *ever* speaks to her.

(343) He was against doing *anything* like that.

The NPPs are not licensed in this environment:

(344) *I am surprised that he speaks to her *either*.

(345) *I regret that he speaks to her, and *neither* do I.

(346) *I regret that my car is here *yet*.

(347) *I regret that I'm in Spain *anymore*.

4.4 Environments which license some NPPs

- Superlatives

NPIs *any* and *ever* are licensed in superlatives (Herdan and Sharvit 2006; Nishiguchi 2005):

(348) This is one of the best films I have *ever* seen.

(349) It's by far the best option that has *any* chance of coming to pass at this point.

[10] A particular construction with *yet* is an exception to this generalization:

(i) This is better than anything *yet* invented.

Some NPPs are licensed in superlatives, and some are not. The aspectual NPPs *yet* and *anymore* are licensed by a superlative:

(350) It is by far the best book I have *yet* purchased in the field of Web Design.

(351) This is the best film that is shown here *anymore*.

(352) Government makes activists sound bad but it is the best chance this country has *anymore*.

The additive NPPs *either* and *neither* are not licensed by a superlative:

(353) *This is the most beautiful city I have visited *either*.

(354) *This is the most beautiful city I have visited, and *neither* have you.

- The second argument of *only*

NPIs *any* and *ever* are licensed in the second argument of *only*:

(355) Only young writers *ever* accept suggestions with *any* sincerity. (Klima 1964:311)

(356) I only eat *any* meat when I'm depressed. (Horn 1996:17)

(357) Only Lucy has *any* money left. (Roberts 2006:5)

The NPPs are usually not licensed by *only*:

(358) *Only John has arrived *yet*.

(359) Of all the people in this room, only John has been to Amsterdam. *Only John has been to Brussels, *either*.

However, with a different syntax *only* can license *anymore*:

(360) Work was the only thing that mattered to him *anymore*.

Haycock (2000) noticed that in some cases when *anymore* occurs with *only* it is not clear if it is the positive or the NPI *anymore*. This is true, for example, for the following sentence:

(361) I only throw small parties *anymore*.

4.5 Summary and observations

To summarize, the following are the environments that do and do not license the NPPs:

Environments that license the NPPs:

Negation, *doubt*, *few*, *rarely*, negative implicative verbs like *fail* and *refuse*, *without*, *too*-construction of excess.

NPI-licensing environments that do not license the NPPs:

antecedents of conditionals, restrictors of quantifiers, comparatives, superlatives, emotive factives, *before*.

NPI-licensing environments that license some NPPs:

only, superlatives

One of the questions to be addressed in this thesis is: what is the extra licensing condition distinguishing between the environments that do license the NPPs and those that do not?

Some preliminary observations can be made that will lead us closer to the proposed answer. First, the environments that license the NPPs are of the kind that can be informally described as feeling 'negative'. On the other hand, the environments that do not license the NPPs do not feel 'negative'. Some of the environments that license the NPPs are analyzed as 'negative' in earlier literature (Jespersen 1917; Klima 1964) and in current psycholinguistic research (Moxey and Sanford 1993, 2000; Geurts and van der Slik 2005). For example, many speakers feel that sentences with syntactic negation, the words *few* and *rarely*, negative implicative verbs and constructions, and the verb *doubt* feel negative, and license the NPPs. Many of these expressions and constructions have positive counterparts. On the other hand, conditionals, restrictors of universals and comparatives do not feel negative, do not have positive counterparts, and do not license NPPs.

It must be noted that some environments to not quite fit this observation. Some of the NPI-licensing emotive factives, such as *sorry*, definitely feel negative, yet NPPs are not allowed. The superlatives are not negative, yet they do allow some NPPs. The

sentences with *only* feel somewhat negative, yet the NPPs are only licensed in some limited cases. This information is presented in Table 5.

licensing negativity	NPPs licensed	NPPs not licensed
feels negative	syntactic negation, scope of *few* and *rarely*, negative implicative verbs and constructions, complement of *doubt*	complement of emotive adversatives, second argument of *only*
does not feel negative	superlatives	antecedents of conditionals, restrictors of quantifiers, comparatives

Table 5. Negativity and NPP licensing

This observation cannot by itself serve as a formal condition, since the 'negative' feeling is a notion which is not formally defined. However, this notion can lead us to a formal condition. Developing this observation, I propose below in this thesis that the relevant licensing condition is indeed a kind of negativity: *semantic negativity*. This notion is explicated in section 7.4. An extra criterion is proposed that distinguishes the NPI-licensing environments that are negative from those that are not. The NPP-licensing environments are a proper subset of the NPI-licensing environments. To the extent that the NPI-licensing environments can be described as downward monotone, downward monotonicity is a necessary, but not a sufficient condition for semantic negativity.

Another observation is related to the syntactic relation between the licensor and the NPP. In most of the environments discussed above the NPP is in a subordinate clause relative to the licensing expression. The only cases in which the NPP is in the

same clause as the licensor are that of syntactical negation, the scope of *few* and *rarely*, and *only*-clauses.

Ignoring the *only*-clauses for the moment, the tentative conclusion is that if an NPI-licensing environment is created in the same clause as the licensor, the NPPs are licensed. The other environments, in which the licensor and the NPP is not in the same clause, are divided into those in which the NPPs are licensed (complements of *doubt*, negative implicative verbs and constructions) and those in which they are not (antecedents of conditional, restrictor of universal, comparative). It seems that the NPP-licensing is blocked by some kinds of subordination. The licensing question can also be formulated as follows: which syntactic constructions of subordination are transparent to NPP-licensing, and which constructions block the licensing?

licensing DM in the predicate position of	NPPs licensed	NPPs not licensed
main clause	negation *few* (second argument) *rarely*	second argument of *only*
subordinate clause	complement of *doubt* and negative implicative verbs, negative implicative constructions: *without*, *too* of excess	antecedents of conditionals, restrictors of quantifiers, comparatives, superlatives, emotive factives

Table 6. NPP licensing and the syntactic relation between the potential licensor and the NPP

5 The distribution of the NPP and earlier accounts

5.1 Is it antiadditivity?

5.1.1 The algebraic hierarchy of NPI *strength*

To explain the observation that the NPIs vary with respect to their licensing environments (e.g., Edmondson 1981), a number of studies (Nam 1994; Zwarts 1995, 1996, 1997; van der Wouden 1997) introduced a hierarchy of NPI strength according to the logical properties of the environments. In addition to downward monotonicity, two other logical properties of environments, anti-additivity and anti-morphicity, are used to explain the behavior of negative polarity licensing. The hirearchy is based on the split generalized De Morgan laws, originally formulated for sentential negation. The environments are ranked according to the laws each environment satisfies. The laws are:

(362) Split De Morgan laws

a. $F(X \cap Y) \Rightarrow F(X) \vee F(Y)$

b. $F(X) \vee F(Y) \Rightarrow F(X \cap Y)$

c. $F(X \cup Y) \Rightarrow F(X) \wedge F(Y)$

d. $F(X) \wedge F(Y) \Rightarrow F(X \cup Y)$

Each of the laws (b) and (c) is equivalent to downward monotonicity, and thus they are equivalent to each other. The properties defining the environments in the hierarchy are as follows (letters in parentheses refer to the laws satisfied by environments that have that property).

(363) F(X) is downward monotone iff $X \subseteq Y \Rightarrow (F(Y) \Rightarrow F(X))$. (b,c)

F(X) is anti-additive iff $F(X \cup Y) = F(X) \wedge F(Y)$. (b,c,d)

F(X) is anti-multiplicative iff $F(X \cap Y) = F(X) \vee F(Y)$. (a,b,c).

F(X) is anti-morphic iff it is both anti-additive and anti-multiplicative. (a,b,c,d)

Anti-morphic environments are most like negation and, like it, satisfy all the four laws, while merely downward monotone environments, which don't have the stronger properties, only satisfy two of the four laws.

Zwarts (1995) divides NPIs into weak, strong and superstrong. A weak NPI appears in all downward monotone environments, a strong NPI appears only in anti-additive environments, and a superstrong NPI only appears in anti-morphic environments. A similar classification is presented by van der Wouden (1997), using the terms weak, medium, and strong NPIs. In the rest of this discussion I will use van der Wouden's terminology.

Zwarts (1995)	van der Wouden (1997)	licensed by
weak	weak	DE environments
strong	medium	anti-additive environments
superstrong	strong	anti-morphic environments

Table 7. The algebraic NPI strength hierarchy

Definitions from van der Wouden (1997):

(364) *Weak Negative Polarity Items* are expressions which can felicitously occur in monotone decreasing contexts.

(365) *Negative Polarity Items of medium* strength may be licensed by anti-additive contexts but not by downward monotonic ones.

(366) *Strong Negative Polarity Items* may only be licensed by anti-morphic contexts.

The Dutch NPIs *ooit* 'ever', *hoeven* 'need', *kunnen uitstaan* 'can stand' are given as examples of weak NPIs, *ook mar* 'any' is an example of a medium strength NPI, and *mals* 'tender', *pluis*, and *voor de poes* are examples of strong NPIs. The following facts on the distribution of NPIs are given in support of the hierarchy.

A non-anti-additive downward monotone environment, such as the second argument of *weinig* 'few', licenses *kunnen uitstaan*, but not *ook mar* and *mals*:

(367) a. Weinig monniken *kunnen* vader abt *uitstaan*.

Few monks can father abbot stand.

'Few monks can stand father abbot'.

b. *Weinig monniken zullen *ook mar* iets bereiken.

Few monks will at all anything achieve.

'Few monks will achieve anything at all.'

c. *Van weinig monniken was de krietiek *mals*.

Of few monks the criticism was tender.

'The criticism was tender of few monks.'

An anti-additive environment, such as the second argument of *geen* 'no', licenses *kunnen uitstaan* and *ook mar*, but not *mals*:

(368) a. Geen kind *kan* de schoolmeester *uitstaan*.

No child can the schoolmaster stand.

'No child can stand the teacher'.

b. Geen kind zal *ook mar* iets bereiken.

No child will anything reach.

'No child will reach anything'.

c. *Geen oordeel was *mals*.

No judgment was tender.

'No judgment was tender.'

An anti-morphic environment such as the one created by *allerminst* 'not-at-all' licenses *kunnen uitstaan*, *ook mar* and *mals*:

(369) a. De kinderen *kunnen* de schoolmeester allerminst *uitstaan*.

The children can the schoolmaster not-at-all stand.

'The children just can't stand the teacher to any degree at all.

b. De abt heeft het geheim allerminst aan *ook mar* iemand willen vertellen.

The abbot has the secret not-at-all to any body want tell.

'The abbot didn't want to tell the secret to anybody at all'.

c. Zijn oordeel was allerminst *mals*.

His judgment was not-at-all tender.

'He was pretty harsh in his judgment'.

5.1.2 Two interpretations of the NPI strength hierarchy

Interestingly, two possible interpretations of this hierarchy can be found in the NPI literature, and, to my knowledge, this fact has not been discussed yet. The first interpretation, which I will call the *necessity interpretation*, is to understand the hierarchy literally according to the formulations of van der Wouden and Zwarts. Let's say we have some negative polarity item. Then we can classify it as a weak, medium or strong as follows. If all the environments it occurs in are anti-morphic, then it is a strong NPI. If not all the environments it occurs in are anti-morphic, but all are anti-additive, it is an NPI of a medium strength. If not all the environments it occurs in are anti-additive, but all are monotone decreasing, it is a weak NPI. The hierarchy only specifies the necessary conditions for the licensing of the NPI.

To the extent that the NPIs only occur in downward monotone environments, all the NPIs can be classified as weak, medium or strong. The problem is that in this understanding, it is not clear what the explanatory contribution of the hierarchy is. In other words, introducing this hierarchy does not make any claim beyond postulating the downward monotonicity as the necessary licensing conditions. It is trivially true, and all the possible observations of NPI distribution are consistent with this hierarchy. There was some criticism of the hierarchy, showing that the items classified as strong occur in environments that are not anti-additive. Such criticism does not undermine the hierarchy, it only shows that the items should be reclassified as weak. Other criticism (Krifka 1995; Giannakidou 1999) shows that the NPIs can occur in environments that are not downward monotone. This problem is not specific to the

hierarchy, the main contribution of which is to present conditions stronger than downward monotonicity.

Other hierarchies similar to this one can be introduced that would classify the NPIs as weak, medium, or strong, according to other criteria. Abstracting from the specific examples, let's say we have items that can occur in a set A of environments. We can define some proper subset A' of A, and some proper subset A" of A': A" $\subset$ A' $\subset$ A. Then items only occurring in A" can be called strong, those that can occur outside A" but only occur in A' can be called medium, and those occurring in A outside A' can be called weak. All the possible observations can be accommodated in such a scheme, regardless of the choice of A' and A".

There is another possible interpretation of the NPI strength hierarchy, which I will call the *equivalence interpretation*. According to this interpretation, the hierarchy specifies the *necessary and sufficient* condition for the NPI licensing, and it does make a claim regarding the possible distributions of the negative polarity items. This understanding can be formulated as follows:

(370) There are three kinds of NPIs: weak NPIs, medium strength NPIs, and strong NPIs.

The strong NPIs appear in all the anti-morphic environments, and only in anti-morphic environments.

The medium strength NPIs occur in all the anti-additive environments, and only in anti-additive environments.

The weak strength NPIs occur in all the downward monotone environments, including those that are not anti-additive.

The following two implicational rules follow from this formulation. These rules make a potentially refutable claim regarding the distribution of the NPIs.

(371) If an NPI occurs in some non-antiadditive downward monotone environment, it will occur in all the anti-additive environments.

If an NPI occurs in some anti-additive environment, it will also occur in all the anti-morphic environments.

Since this interpretation is different from the literal interpretation of the hierarchy as formulated by Zwarts and van der Wouden, it is important to understand the factors that lead to the spread of this interpretation. First, there are passages in the studies proposing the hierarchy that support this interpretation, such as the following: "Negation and other antimorphic contexts are indistinguishable as far as negative polarity items are concerned. In other words, with respect to the semantic properties relevant for the triggering of polarity items, all antimorphic contexts are alike." (van der Wouden 1997:126).

The choice of the examples demonstrating the validity of the hierarchy could be the second factor. The examples in van der Wouden (1997) show the weak NPIs licensed in all the downward monotone environments, all the medium strength NPIs licensed in all the anti-additive environments, and all the strong NPIs licensed in all the anti-morphic environments. These data are consistent with both interpretations of the hierarchy, and, in fact, support the equivalence interpretation. Examples of some weak NPIs not licensed in some downward monotonic environments, some medium strength NPIs infelicitous in some anti-additive environments, or some strong NPIs not licensed in some anti-morphic environments would make clear that the hierarchy states the necessary, but not the sufficient, conditions; but such examples are missing.

The difference in the predictive power of the hierarchy can be the third factor in favor of the equivalence understanding. As discussed above, the necessity interpretation has a very weak predictive power. The equivalence interpretation predicts a number of implicative rules, and has much stronger consequences.

This interpretation is explicitly expressed in (Vasishth 1998, 2001). Rullmann (2003:360) seems to adopt this interpretation, saying that "*either* thus falls outside the Zwarts/van der Wouden implicational hierarchy of NPIs which predicts that any NPI that is licensed by downward entailing expressions which are not anti-additive should also be licensed by anti-additive ones." Pereltsvaig (2004) observes that the *–libo* items in Russian are licensed in most downward monotone context, but not in the anti-morphic contexts, and concludes that this fact is a problem for the hierarchy. Similarly, Krifka (1995) observes that "the class of superstrong NPIs doesn't seem to

be definable in terms of anti-morphicness" and finds the contrast between (372) and (373) to be a problem for the hierarchy. In the necessity interpretation, the infelicitousness of (373) is not inconsistent with *one bit happy* being a (super)strong NPI, since the anti-morphicness is only a necessary condition for licensing.

(372) John wasn't one bit happy about these facts.

(373) *It is not the case that John was one bit happy about these facts

Since in the equivalence interpretation the hierarchy makes a claim, it is helpful to understand what would constitute a counterexample to this claim, and the implicative rules formulated above help in this task. If we found an NPI that is licensed in some non-anti-morphic environment, and not licensed in some anti-morphic environment, such an NPI would also be a counterexample to the hierarchy. If we found an NPI that is licensed in some non-anti-additive downward monotone environment, but is not licensed in some anti-additive environment, such an NPI would be a counterexample to the hierarchy. In the next section I examine the negative polarity particles and it turns out that the NPPs are items of this kind, and indeed a counterexample to the hierarchy.

5.1.3 The NPPs and the hierarchy

Does the distribution of the NPPs fit the algebraic NPI strength hierarchy? The answer depends on the interpretation. According to the necessity interpretation of the hierarchy, the answer is trivially positive, since this hierarchy can accommodate all the possible distributions of the NPIs. Since the NPPs can occur in environments that are not anti-additive, such as the second argument of *few*, the NPPs should be classified as weak NPIs.

What if we adopted the equivalence interpretation of the hierarchy? Some think that the answer would still be positive, that the hierarchy adequately explains the distribution of the NPPs. For example, Szabolcsi (2004:426-428) claims that the distribution of *yet* can be characterized by means of the condition of anti-additivity, that is, *yet* occurs only in environments that are anti-additive. The following sentences are given as evidence:

(374) I haven't been here *yet*.

(375) No one has been here *yet*.

(376) *At most five people have been here *yet*.

(377) *I regret that you have been here *yet*.

The first two environments are anti-additive, and the other two are not, so it may seem that anti-additivity is a condition that is sufficient to license *yet*.

However, examining other environments shows that this is not the case. On the one hand, the second argument of *few* and *rarely* are downward monotone, but not anti-additive. This is demonstrated by the fact that sentence (378) can be false when (379) is true,

(378) Few people sing or dance.

(379) Few people sing and few people dance.

The NPP *yet* and other NPPs are licensed in the second argument of *few* (380).

(380) Few tourists are here *yet*.

This is contrary to requiring anti-additivity as the licensing condition.

The fact that the NPPs are licensed in this environment, which is downward monotone but not anti-additive suggests that NPPs are weak NPIs, licensed by downward monotonicity.

On the other hand, antecedents of conditionals and restrictors of universals, both anti-additive environments, fail to license the NPPs, as if the NPPs were strong NPIs. The anti-additivity of the restrictor of the universal is illustrated by the equivalence of the following sentences:

(381) Everyone who sang or danced received a prize.

(382) Everyone who sang received a prize and everyone who danced received a prize.

The fact that NPPs are not licensed in the restrictor of universal quantifiers is contrary to prediction from Szabolcsi's postulation of anti-additivity as the licensing condition.

(383) *Everyone who has been to Brussels *either* wants to go there again some day.

(384) *Everyone who saw the movie *yet* liked it.

Environment	Logical properties	NPP licensing
second argument of *few*	downward monotone, not anti-additive	NPPs licensed
antecedent of conditional, restrictor of universal	anti-additive (and downward monotone)	NPPs not licensed

Table 8. The NPPs and the NPI strength hierarchy

The examples above show that suggesting anti-additivity as the licensing condition for *yet* is not supported empirically. The assumption that the NPPs belong to one of the classes of the algebraic hierarchy leads us to contradictory conclusions: the licensing of NPPs in the second argument of *few* and *rarely* suggests that they are weak NPIs, and the non-licensing of NPPs by the restrictor of a universal quantifiers suggests that they belong to the strongest class of the NPIs. Therefore, NPPs cannot be categorized as belonging to one of the classes postulated by the hierarchy. They show that this hierarchy is not a universal classification of the distribution of all NPIs.

5.2 The distribution of NPPs and the earlier proposals

5.2.1 Klima (1964): 'either' and 'neither' as "tests for negation"

Of the NPPs discussed in this section, *either* is the one whose distribution has been most thoroughly investigated. Klima (1964) discusses the use of *either* as a negative polarity particle, under the name '*either*-conjoining'. He notices that it is the host clause that should be negative in some way in order to license *either*. He recognizes that some adverbs, which he calls 'negative pre-verbs' (386), are as good as syntactic negation (385) in licensing *either*, unlike positive adverbs, which do not license *either* (387).

(385) Publishers will usually reject suggestions, and writers will not accept them, *either*.

(386) Publishers will usually reject suggestions, and writers will never/seldom/hardly accept them, *either*.

(387) *Publishers will usually reject suggestions, and writers will always/surely accept them, *either*.

The fact that it is the form of the host clause, and not of the antecedent clause, that matters for the licensing of *either*, is demonstrated by the ungrammaticality of example (388) below. This sentence is formed by reversing the roles of the clauses of (386). In (386), the host clause has a negative adverb, while the antecedent clause doesn't, and *either* is licensed. In (388), it is the antecedent clause that has a negative adverb, and the host clause doesn't, and *either* is not licensed.

(388) *Writers will never accept suggestions, and publishers will usually reject them, *either*.

Either-conjoining is used by Klima as a "test for negation". Such tests are introduced to achieve a different goal: to explain which environments allow the use of NPIs like *any*. These NPIs occur not only in sentences which are syntactically negative, but also in sentences with some other elements. At first Klima deals with this by extending the definition of negativity to include more sentences in addition to those with syntactic negation. The tests for negation are introduced to define this new extended notion of negation. The tests are: *either*-conjoining, *neither*-tags, *not even* tags (389), and polarity question tags (390). Sentences that pass all the tests are considered to be negative in the extended sense.

(389) a. The writer will not/never/seldom/rarely accept suggestions, not even reasonable ones.

b. *The publisher often disregards suggestions, not even reasonable ones.

(390) a. Writers will never accept suggestions, will/*won't they ?

b. Publishers will reject suggestions, won't/*will they?

One successful application of *either*-conjoining is in showing that the adverbs *unintentionally* and *unfortunately* do not make a sentence negative, despite their negative form. This is shown by the fact that they do not license the use of *either*:

(391) *Publishers will unintentionally reject suggestions, and writers will unintentionally reject them, *either*.

The acceptability of *neither*-tags is another one of Klima's tests for negation. Klima sees sentences with *neither*, such as (392), as "a truncated and inverted form of *either*-conjoining", which in modern terminology would be described as ellipsis.

(392) Writers won't be accepting suggestions, and *neither* will publishers.

As is the case with *either*, at least in some idiolects, negative pre-verbs allow *neither*-tags:

(393) Writers will seldom/never accept suggestions, and *neither* will publishers.

Klima's approach to the usage of *either* and *neither* is opposite to the one usually pursued in the NPI-licensing literature. Klima takes *either*-licensing and *neither*-licensing as given, and, using them as tests, defines sentence negation based on *either*- and *neither*-licensing properties. This way the constructions with *either* and *neither* are given a special status, and are not seen as negative polarity items by themselves. Their distribution is not given an explanation of the kind other NPIs are given. This point of view on *either* and n*either* is continued in (McCawley 1988) and (Huddleston and Pullum 2002).

On the other hand, if we treat *either* and *neither* as NPIs, our task is to define the condition that would independently predict their distribution. This is the approach of the other works on *either* discussed in this section, and this is the approach I adopt in this study. The negative polarity particles are treated as negative polarity items, and are not assigned a special status in defining negativity.

5.2.2 Green (1973)

Green (1973), continuing Green (1968), explores the *too/either* alternation and Klima's claims regarding *either*. One of the observations Green wants to account for is

that not every negative adverb licenses *either*. The negative adverbs *never*, *scarcely*, and *seldom* license *either*, while adverbs like *unfortunately* and *unintentionally* do not, as just remarked. Green's example is:

(394) *Bill left, but John unfortunately left *either*. [(100) in (Green 1973)]

The licensing condition she formulates for *either* makes essential use of semantic decomposition, representing certain predicates as a complex combination of simpler predicates. Negation is one of the simple predicates available for use in decomposition. For example, *seldom* is decomposed as [ALMOST [ALWAYS [NOT]]], while *unfortunately* is decomposed as [NOT [FORTUNATELY]].

The condition she proposes is formulated in the framework of generative semantics. Using only the notion of decomposition, her condition can be reformulated as follows:

(395) A predicate *P* can license *either* if in the decomposition of *P* the innermost element is *NOT*.

This condition, given the proposed decompositions, predicts correctly the licensing behavior of *seldom*, *unfortunately* and adverbs similar to them. The negator NOT is the innermost element in the decomposition of *seldom*, and *either* is indeed licensed by *seldom*. On the other hand, NOT is not the innermost element in the decomposition of *unfortunately*, and *either* is indeed not licensed by *unfortunately*.

The problem with Green's condition is lack of precision that results from the fact that there are no clearly defined rules for semantic decomposition. For example, the decomposition that is proposed for *seldom* is [ALMOST [ALWAYS [NOT]]], with negation as the last element. However, it also seems plausible to decompose *seldom* as [NOT [FREQUENTLY]], with the negator NOT not appearing in the last position, thus predicting non-licensing of *either* with *seldom*. Sometimes even positive adverbs can be given a decomposition that includes negation. For example, *always* can be decomposed as [NEVER [NOT]], and this analysis predicts that such an adverb will license *either*, contrary to fact.

The behavior of the expression *impossible* is also problematic for Green's analysis. She analyzes it as [NOT [POSSIBLE]], predicting that it would not license *either*, and supports this conclusion by example (396), which she judges as ungrammatical. However, examples of *either* licensed by *impossible* do occur (397), so the prediction turns out to be incorrect.

(396) *It's impossible to read all these books, but it's impossible to ignore them all *either*. (judged as ungrammatical in Green (1973:235))

(397) It's hard to like Jackass these days, but it's impossible to hate it *either*.[11]

Similarly, Green thinks that the verb *refuse* does not allow *either* (398) and motivates it by a decomposition [WILL [NOT [DO]]]:

(398) *Mary refused to leave *either*.

A decomposition [NOT [AGREE]] would support the same conclusion. However, we have seen in example (285) above that *refuse* does, in some cases, license *either*. Such data could be explained by a decomposition of *refuse* as [DECIDE [NOT]]. Therefore, in this case, just like in the case of the adverb *seldom*, Green's condition does not give robust predictions regarding the distribution of *either*. Since it is not possible to clearly apply this condition and receive an unambiguous answer, I excluded it from the final comparison of the different proposals at the end of this section.

5.2.3 Nathan (1999)

Recently, Nathan (1999) and Rullmann (2003) devoted studies to the particle *either*. While they collected a considerable amount of data regarding the environments in which *either* can and cannot appear, the formal criteria that they proposed are not adequate to distinguish between these classes of environments.

Nathan (1999) addresses the question of the licensing of *either*, and proposes two necessary licensing conditions:

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[11] Printed in *The Guardian*, UK, November 24, 2006:
http://film.guardian.co.uk/News_Story/Critic_Review/Guardian_review/0,,1955384,00.html

(399) a. Downward Entailing Restriction: For *either* to be licensed, the focused item must be within the scope of a downward entailing operator.

b. Nonveridicality Restriction: *Either* cannot appear in a veridical context.

The importance of the focused item being in the scope of the downward monotonicity, and not just of *either* itself, is demonstrated by the following contrast[12]:

(400) *Sue doubts Bill left. $[\text{Mary}]_F$ doubts Bill left, *either*.

(401) Mary doubts John left. Mary doubts $[\text{Bill}]_F$ left, *either*.

I find that the issue of focus is better dealt with as part of the presupposition that *either* has as an additive particle, the way it is done in Rullmann's analysis presented below.

Nonveridicality is defined as follows (Zwarts 1995; Giannakidou 1999):

(402) Let O(p) be a sentential operator. O is *veridical* iff O(p) => p is logically valid. O is *nonveridical* iff O is not veridical. O is *antiveridical* iff O(p) => ¬p is logically valid.

If may be surprising that nonveridicality is proposed as a constraint in addition to downward monotonicity, since Zwarts (1995) showed that downward monotone contexts are a subset of nonveridical contexts. The reason the condition of nonveridicality does not apply in some environments considered downward monotone is that the notion of downward monotonicity used in the NPI-licensing research is Strawson downward monotonicity (von Fintel 1999), namely monotonicity with the presuppositions satisfied. This condition is not strictly stronger than nonveridicality, as will be shown below.

These conditions correctly explain the licensing of *either* in the scope of *doubt* and negative implicative verbs and constructions. All these environments are non-veridical, and the NPPs do occur in them, as predicted.

The extra condition of non-veridicality also successfully explains the non-licensing of the NPPs in the complements of emotive factives. This environment is considered

[12] Some native speakers reject both sentences with *either*.

to be Strawson-downward-monotone, but it is veridical. Therefore, according to the condition of nonveridicality, the NPPs are not expected to occur in such environments. Another environment in which this condition can be helpful is the restrictor of quantifiers. This environment has an existential presupposition, and thus can be said to be veridical, explaining the non-licensing of NPPs.

However, there are other environments in which this condition's predictions are contrary to fact. The antecedent of a conditional and the complement of the comparative construction are two downward monotone environments that are not veridical, but nevertheless do not license the NPPs. This is contrary to the proposed condition. A different kind of counterexample is sentences with *few* and *rarely*. Such sentences do not contain any sentential operators, and no clause is in a non-veridical environment. Nevertheless, the NPPs are licensed in these sentences.

5.2.4 Rullmann (2003)

Rullmann (2003) examines the behavior of the NPP *either*, and proposes a semantics that includes a licensing condition.

The additive particle *too* carries a presupposition that depends on sentence focus. For example, the sentence in (403) presupposes that I introduced someone other than Bill to Sue, while the sentence in (404) presupposes that I introduced Bill to someone other than Sue (Kadmon 2000:256).

(403) I introduced BILL to Sue, too.

(404) I introduced Bill to SUE, too.

Rullmann describes the presupposition using Rooth's (Rooth 1985, 1992) analysis of focus. According to this analysis, each expression has two semantic values: the ordinary semantic value $[[\alpha]]^o$ and a *focus value* $[[\alpha]]^f$. The focus value is a set of modifications of $[[\alpha]]^o$, in which the focused constituent was replaced by each relevant alternative for it (including the original value). For example, the focus value for *John met BILL* is:

(405) [[John met BILL]] ^{f} =

{*p* | *p* is of the form [[John met *x*]]} =

{ [[John met Bill]], [[John met Sam]], [[John met Tom]]…}

Using this definition, the presupposition of *too* is defined as follows:

(406) [α *too*] presupposes that there is at least one contextually salient proposition p ∈ $[[\alpha]]^{f}$ - {$[[\alpha]]^{o}$} such that *p* is <u>true</u>.

For example, the presupposition of *John met BILL, too*. is that one of the propositions of the form *John met Sam, John met Tom*, etc., is true.

In the analysis for *either,* the presupposition it introduces is defined as follows:

(407) [α *either*] presupposes that there is at least one contextually salient proposition p ∈ $[[\alpha]]^{f}$ - {$[[\alpha]]^{o}$} such that *p* is <u>false</u>.

For example, *John didn't meet BILL, either* presupposes that one of the propositions of the form *John met Sam, John met Tom*, etc., is false.

Unlike *too,* the particle *either*, in addition to a presupposition, has a licensing condition. Rullmann (2003) proposes the following as the licensing condition for *either*:

(408) [α *either*] must be contained in a constituent which implies (i.e. entails or implicates) that $[[\alpha]]^{o}$ is false. [(45.4) in (Rullmann 2003)]

Rullmann is aware that other proposals based on negative inference (Linebarger 1987, 1991) have a problem that "it is very hard to pin down what should count as a negative inference". The proposed condition deals with this problem by specifying that the negative implication must be with respect to $[[\alpha]]^{o}$, unlike the previous proposals.

The negative implication condition proposed by Rullmann explains well some facts of NPP licensing. It explains why negative implicative verbs and constructions license the NPPs: the negation of the embedded clause is entailed by the sentences with these verbs and constructions. The fact that the NPPs are excluded from antecedents of conditionals, comparatives and complements of emotive factives is also

expected: in all of these environments there is no implication of negation of the embedded clause.

However, for a number of environments the predictions of this licensing condition either are unclear or do not correspond to the observations. Sentences with *few* and *rarely* do not imply negation, so, according to the condition, the prediction is that they will not license the NPPs, contrary to fact:

(409) Few Americans have ever been to Spain. Few Canadians have, *either*.

(410) While he rarely grew angry, he rarely joked, *either*.

Similarly, sentences with *doubt* do not necessarily imply the negativity of their complement: *I doubt that John will come* does not necessarily imply *John will not come*. According to Rullmann, *I doubt that John will come* can be taken to implicate *I think that John won't come*, but that by itself does not satisfy the licensing condition. In addition, continuing this line of reasoning, one might say that *I think John will come* also has a negative implication, as it implies *I doubt that John won't come*, and therefore *I think John will come* should also be expected to license the NPPs, contrary to fact. The conclusion is that the proposed licensing condition does not clearly distinguish between the different properties of *doubt* and *think* with respect to the licensing of the NPPs in the embedded clause.

The restrictor position of quantifiers is also a problematic environment for the proposed licensing condition. For positive quantifiers such as *some*, *every*, and *all* there is no problem: there is no negative implication, and the NPPs are not licensed. The problem is with the negative quantifier *no*: it licenses NPPs in the second argument (411), but not in the first argument (412):

(411) No one of us has ever been to Amsterdam. No one has been to Brussels *either*.

(412) No one of us has ever been to Amsterdam. *No one who has been to Brussels *either* wants to go there again some day.

However, the truth conditions for *no*(A)(B) are symmetric, and *no*(A)(B) is equivalent to *no*(B)(A). Both sentences entail that there are no A that B, and that there are no B that A. Therefore, (408) predicts, contrary to fact, that NPPs will be licensed

in the restrictor of *no* to the same extent that they are licensed in the second argument of *no*. Rullmann observes that there is some non-truth-conditional difference between the two arguments of *no*, namely, that *no*(A)(B) is in some way a claim *about* A, introducing an existential import for A, but not for B. I develop this observation later in this work when I introduce my proposal for the licensing of the NPPs.

Rullmann is aware of these problems, and he indeed mentions that the licensing condition he proposes is "not much more than a suggestion that eventually may become the basis for a full explanation of the licensing behavior of either" (Rullmann 2003:366). I believe that my proposal in this study takes us closer to this goal.

According to Löbner's (1989) analysis, the particles *yet* and *anymore* can be used with a negative assertion. If we understand this condition as syntactic negation, it is definitely too strict. As we have seen above, there are many other environments licensing these particles and the other NPPs. If we understand this condition as requiring an environment that entails the negation of the clause, then this condition becomes very similar to the one proposed by Rullmann that was discussed above.

Ladusaw (1980a:4) mentions *yet* among the negative polarity items whose behavior, he thinks, can be explained by the condition of downward monotonicity. It was shown above that this condition is too permissive for the NPPs, as it does not explain the non-licensing of the NPPs in environments such as antecedent of conditionals and restrictors of universals.

The following table summarizes the predictions of the earlier proposal regarding the distribution of the NPPs in different environments.

	NPPs occur	downward monotonicity (Ladusaw 1980a)	antiadditivity (Szabolcsi 2004)	DM and NV (Nathan 1999)	negative implication (Rullmann 2003)
Negation	yes	yes	yes	yes	yes
scope of *few, rarely*	yes	yes	no	no	no
negative implicative verbs	yes	yes	yes	yes	yes
negative implicative constructions	yes	yes	yes	yes	yes
doubt	yes	yes	yes	yes	no
antecedents of conditionals	no	yes	yes	yes	no
restrictor of *every*	no	yes	yes	no	no
restrictor of *no*	no	yes	yes	yes	yes
comparatives	no	yes	yes	yes	no
emotive factives	no	yes	yes	no	no

Table 9. Distribution of NPPs and predictions of earlier proposals

6 The notion of assertivity

6.1 Assertivity – motivation

Let's start with Rullmann's licensing condition for *either*, which was discussed in section 5.2.4 and is repeated here for convenience:

(413) [α *either*] must be contained in a constituent which implies (i.e. entails or implicates) that $[[\alpha]]^{o}$ is false. [(45.4) in (Rullmann 2003)]

I begin by reformulating this condition as follows:

(414) The NPPs are licensed in a clause α if it appears in an environment F() such that F(α) implies that α is false.

This condition gives wrong predictions for a number of environments. To summarize the discussion in 5.2.4, first, the sentences with *few/seldom* do not have the negative implication required by the condition, but they do license NPPs. Second, this condition does not distinguish between the first argument position of the quantifier *no*, which does not license NPPs, and the second argument position of *no*, which does. Third, the licensing of NPPs by the verb *doubt* is also not explained by the condition.

(415) Few/*many tourists are here *yet*.

(416) While he rarely grew angry, he rarely joked, *either*.

(417) No one of us has ever been to Amsterdam. *No one who has been to Brussels *either* wants to go there again some day.

(418) No one of us has ever been to Amsterdam. No one has been to Brussels *either*.

(419) I doubt he can move to the house, *either*.

At this point, let's make use of the observation that all the environments in which the NPPs are licensed are NPI-licensing and downward monotone. This means that instead of trying to provide a condition that does not use the notion of downward monotonicity, we can start with downward monotonicity and try to formulate an extra licensing condition that would distinguish between the downward monotone environments that license the NPPs and those that do not.

Using this observation, we can try to modify Rullmann's condition account for the licensing of the NPPs by the words *few* and *rarely*. Although this environment is downward monotone, the downward monotone environment is created in the same clause in which *few* or *rarely* appears, and a clause is positively implicative relative to itself. Most downward monotone environments are not implicative at all, they imply neither α nor ¬α. Let's explore the possibility that after determining that an environment is downward monotone, it is the existence of an implication – either negative or positive – that matters. Revising Rullmann's condition to allow for both positive and negative implication, and adding downward monotonicity as part of the licensing condition, we arrive at the following tentative proposal:

(420) Tentative proposal 1:

> The NPPs are licensed in a clause α if α appears in an environment F() such that the following conditions hold:
>
> a. α has a downward monotone environment[13]
>
> b. either F(α) implies that α is true or F(α) implies that α is false

This reformulation indeed includes the environments created by *few* and *seldom* among those in which the NPP-licensing is predicted. Since most other environments have neither positive nor negative implication, the predictions for those environments do not change. Another environment for which proposal 1 changes the prediction is that of emotive factives. The complements of these verbs are presumed to be Strawson downward monotone, and they are also presupposed to be true; so they satisfy the licensing condition in proposal 1. The NPPs are not licensed in this environment, so the change in the prediction is not helpful. The predictions regarding the other problematic environments, namely the first argument position of *no* and the complement of *doubt*, are not affected by the difference between proposal 1 and Rullmann's condition.

[13] The requirement of downward monotonicity will be refined in section 7.4, in which I introduce a definition of a downward monotone clause. That definition is more restricted than the formulation here.

Now we can proceed with augmenting proposal 1. The issue now is: how to distinguish between the emotive factives and the other environments, so that we can exclude the emotive factives from the environments in which we predict NPP-licensing? Another question is: how to distinguish between the first and the second argument position of the quantifier?

One special property of the complements in emotive factives is that they are just that: factive. They are presupposed by the combined sentence. For example, sentence (421) with the factive verb *sorry* presupposes the truth of the subordinate clause *he left so early*.

(421) I'm sorry that he left so early.

Let's then modify proposal 1 by excluding the presupposed environments. This makes proposal 2:

(422) Tentative proposal 2:

> The NPPs are licensed in a clause α if α appears in an environment F() such that the following conditions hold:
>
> a. α has a downward monotone environment
>
> b. either F(α) implies that α is true or F(α) implies that α is false
>
> c. F(α) does not presuppose α

The empirical contribution of this step is helpful: the prediction for the emotive factives becomes correct. This change also accounts for the difference between the first and the second argument position of *no*. The first position of a quantifier is known to carry an existential presupposition. It sets the domain for the claim expressed by the clause in the second argument position, and the domain is presumed to be non-empty.

However, some problems remain. First, the licensing with *doubt* is not explained. Second, the condition becomes complex and counterintuitive. The extra condition of implicativity without presupposition does not seem to correspond to any intuitive notion of sentence structure.

How can we simplify the condition of 'implicativity without presupposition'? The main two implication classes of a sentence are assertion and presupposition. In fact, some define presupposition as a clause which is entailed by a sentence but not asserted (Abbott 2000). Therefore, if a sentence has an implication, it is either an assertion or a presupposition. Since we want to exclude the presuppositions, we are left with the assertion. This gives us tentative proposal 3:

(423) Tentative proposal 3:

> The NPPs are licensed in a clause α if α appears in an environment F() such that the following conditions hold:
>
> a. α has a downward monotone environment
>
> b. either F(α) asserts that α is true or F(α) asserts that α is false

The prediction regarding the problematic environments remains the same. The complement of emotive factives is not asserted, so the NPPs are predicted not to be licensed. The second argument position of a quantifier contains an assertion, while the first one does not, again resulting in correct predictions.

In fact, the empirical coverage of this proposal is even better than that of proposal 2. Although the complement of *doubt* is not an implicative environment, the negation of the complement is asserted when the complete sentence is asserted, as I will claim below. Therefore this proposed condition predicts that the NPPs are licensed in the complement of *doubt*.

The main condition of NPI licensing, namely downward monotonicity, is defined in terms of environments. In order to formulate a formal licensing condition, I would like to show how *assertivity* can also be defined as a property of an environment. Briefly, a clausal environment F(α) is *positively assertive* if asserting F(α) also asserts α. An environment is F(α) is *negatively assertive* if asserting F(α) also asserts ¬α. An environment is assertive if it is positively assertive or negative assertive. The formal definition of my notion of assertivity is developed in chapter 7.

In the rest of this chapter I survey the prior literature in which the concept of assertivity has been used. The actual definitions of assertivity vary to some extent among the different studies.

6.2 Hooper (1974): assertive predicates

Hooper (1974) introduces the distinction between two major classes of verbs with sentential complements: *assertive* verbs and *non-assertive* verbs. Her study continues the task of classifying the verbs with sentential complements by properties such as factivity, suggested by Kiparsky and Kiparsky (1970). The classification is primarily based on the ability or inability of a sentence with the given verb to undergo certain syntactic alternations.

The main syntactic difference between the verbs classified as assertive and those classified as non-assertive is in the licensing of the phenomenon Hooper calls 'complement preposing'. According to her definition, "Complement Preposing is an operation which fronts all or part of the complement clause". We can also say that the main clause has been postposed, or that it is used parenthetically (Urmson 1952). The examples are given below:

(424) I think the wizard will deny your request.

(425) The wizard, I think, will deny your request.

(426) The wizard will deny your request, I think.

The original sentence is in (424), in (425) part of the complement has been preposed, and in (426) the complement has been completely preposed. There are other predicates that allow this transformation, namely *seem*, *say*, *suppose*, *imagine*, and these predicates are classified as assertive:

(427) Many of the applicants are women, it seems.

(428) He wants to hire a woman, he says.

(429) This war will never end, we concluded.

Predicates that cannot appear in the parenthetical use, such as *likely* or *probable* are classified as non-assertive:

(430) *Many of the applicants are women, it's likely.

(431) *He wants to hire a woman, it's possible.

According to Hooper, the sentences that underwent complement preposing, such as (425) - (429), contain two assertions. In addition to the assertion expressed by the main clause, there is another assertion expressed by the subordinate clause. This explains the choice of the term *assertive*: the predicates classified as 'assertive' allow their complements to become assertions. For example, in addition to the main assertion, (432) also asserts (433):

(432) It seems that many of the applicants are women.

(433) Many of the applicants are women.

Hooper (1974) defines assertivity as a property of verbs, classifying them into assertive and non-assertive. She notes that the reason the verbs are called assertive is because their complements are assertive. But it is clear that assertivity is not a syntactic property of the complement, that is, the assertive complements do not look different from non-assertive complements. The difference is in the environment in which they occur. The assertive verbs create an assertive environment for their complement, so that the complements are asserted. Likewise, the non-assertive verbs create a non-assertive environment, so that the complements are not asserted.

Since complement-taking verbs are not the only kind of clause embedding, other kinds of clause embedding can also be classified according to the criterion of assertivity. This will be achieved later in this study when the formal definition of assertivity is formulated.

6.3 Cristofaro (2003): assertivity as a criterion for subordination

Cristofaro (2003) uses the notion of assertivity to give a novel definition for the distinction of the main and the subordinate clause. She examines the definitions of subordination based on formal syntactic criteria and finds them inadequate. The notion of assertivity is then used to formulate a pragmatics-based definition of subordination.

The formal definition of subordination is based on a number of tests and criteria. One such criterion is clausal embedding: the subordinate clause is a constituent within the main clause. Another criterion is syntactic dependency, the impossibility of a clause to occur in isolation. A third criterion is semantic dependency. A relation of semantic dependency exists between two clauses if, using Lehmann's (1988:193-4) formulation, one of them (a subordinate clause) occupies a grammatical slot in the other one (the main clause). For example, in (434) the clause *it was a man I knew* is an argument of the verb *said* in *I said*.

(434) I said [it was a man I knew]. (Cristofaro 2003:1)

The fourth criterion involves the property of endocentricity: it is the main clause that determines the grammatical category of the construction. The fifth criterion is desententialization: the subordinate clause sometimes lacks marking of verbal categories such as mood, tense, and aspect.

Cristofaro notices that these criteria are frequently in conflict. For example, in a typical analysis of the sentence below 'he thinks' is the main clause and 'she will arrive tomorrow' is the subordinate clause:

(435) He thinks that she will arrive tomorrow.

If we look at the two clauses of (435) in isolation, we see that 'he thinks' cannot occur in isolation for semantic reasons, while 'she will arrive tomorrow' is a perfectly well-formed standalone sentence. Sometimes when this test is applied to sentences of this kind, the second clause is taken to be 'that she will arrive tomorrow', and this fragment cannot occur in isolation. But it is not obvious that *that* necessarily belongs to the second clause and not to the first one, and 'He thinks that' is not a separate sentence, either.

Another problem is called by Cristofaro the Mismatch problem (Cristofaro 2003:20; Culicover and Jackendoff 1997; Yuasa and Sadock 2002). Cross-linguistically, the same semantic/pragmatic relationships are not coded by the same constructions. Some languages use morphosyntactically reduced constructions, that are usually seen as cases of subordination, to convey the same meaning that other

languages express by the means of coordinate structures. For example, what is expressed in English by a coordination of two verbs (436), can be expressed in Turkish by a construction in which the first verb does not carry inflectional markers, and instead has the affix *-ip* (437):

(436) Mehmet came and went.

(437) Mehmet [gel-ip] git-ti.

Mehmet come-*ip* go-PAST.

'Mehmet came and went' (Underhill (1976:379), cited in Cristofaro (2003:20)).

Similarly, the English conjunction 'and', usually analyzed as introducing coordination, can also be used as follows (Culicover and Jackendoff 1997):

(438) You drink another can of beer, and I'm leaving.

In this case the two clauses are not of equal status, and this sentence actually expresses the conditional "If you drink another can of beer, I'm leaving". This means that despite the conjunction *and*, there is a dependency between the two clauses, and this is in fact a subordinate construction.

Instead of the definitions based on the formal properties of the clauses, Cristofaro (2003:33) proposes a pragmatic definition of the difference between main and subordinate clauses, which she formulates as the Asymmetry Assumption. It is a result of development of ideas expressed by Langacker (1991) in the framework of Cognitive Grammar[14].

(439) Asymmetry Assumption: Subordination is a way of combining clauses in which one of them, the main one, is asserted, and the other, the dependent one, is not asserted.

[14] Cristofaro and Langacker use a slightly different formulation. In their terminology, the information contained in a clause is called a *state of affairs* (SoA). An asserted SoA is said to have an *autonomous profile*, and a non-asserted SoA is said to lack an autonomous profile. Finally, in a case of subordination the profile of the main SoA *overrides* the dependent SoA. For simplicity, I decided not to use this terminology, and reformulated the discussion in more common linguistic terms.

The fact that subordinate clauses are frequently not asserted was observed before. Lehmann (1988:193-4) mentions that normally one distinguishing property of subordinate clauses is a lack of illocutionary force, and that "a subordinate clause may not normally have its own illocutionary force". However, this fact is not usually used as a definition of subordination.

A corollary to this definition is that if all of the clauses in the sentence are asserted, the sentence is an instance of non-subordination. If just one of them is asserted, the sentence is an instance of subordination. In other words, coordination is a way of combining clauses in which each one of them is asserted independently. For example, in (440) each clause is asserted.

(440) The Cubs won and the Padres lost.

(441) The sun was shining and the birds were singing.

Applying the Asymmetry Assumption to sentence (438), we observe that the first clause is not asserted, as it expresses a condition, and the second one is asserted, as it expresses what will happen if the condition is fulfilled. Therefore, the first clause is considered the subordinate clause, and the second one is the main clause.

In my opinion, there is no need to abandon the formal definition of the distinction between the main and the subordinate clause. The difference in assertivity can be explained as follows. The main clause is always assertive. The subordinate clause is assertive if the subordination is of the kind which projects the assertivity from the main clause. However, the fact that the subordinate clause is also asserted does not make it a main clause. It is possible to leave subordination as a formal category of the syntactic link between the clauses, and discuss assertivity independently.

6.4 Syntactic manifestations of assertivity

6.4.1 Root transformations / main clause phenonema

Emonds (1970) discusses a number of syntactic phenomena which, according to his claim, can only occur in main clauses. Using the terminology of Transformation Grammar, a common syntactic theory of that time, he calls them *root transformations*, while other studies preferred more theory-neutral terms, such as *main clause*

phenomena or *root phenomena*. The following main clause phenomena are discussed by Hooper and Thompson (1973):

- VP Preposing

(442) Mary plans for John to marry her, *and marry her he will*.

(443) John says he'll win it, and win it he will.

(444) *John wants to win it, but the claim that win it he will is absurd.

- Negative Constituent Preposing (also known as Negative Inversion)
    - With an adverb:

(445) Never in my life have I seen such a crowd.

(446) Seldom have the children had so much fun.

(447) Never before have prices been so high.

(448) *Nixon regrets that never before have prices been so high.

    - With an NP:

(449) Not a bite did he eat.

(450) *Mary says that not a bite did he eat.

- Directional Adverb/Phrase Preposing

(451) Up the street trotted the dog.

(452) In came the milkman.

(453) *John thinks than in came the milkman.

- Preposing around *be* (Adjective phrase preposing)

(454) More significant would be the development of a semantic theory.

(455) Very important to the Japanese is the amount of mercury being pumped into their bays.

(456) *I expect that very important to the Japanese is the amount of mercury being pumped into their bays.

- Participle preposing

(457) Standing next to me was the president of the company.

(458) Squatting in the corner was a spotted tree frog.

(459) *I never enter the room when squatting in the corner is a spotted tree frog.

- Prepositional phrase substitution

(460) On the wall hangs a portrait of Mao.

- Subject Replacement (cleft)

(461) That Henry forgot the key irritated Carmen.

- Direct quote preposing

(462) “I won the first prize”, Bill exclaimed.

- Complement preposing

(463) Syntax and semantics are related, I think.

- Adverb dislocation

(464) The thief sneaked away in time, evidently.

- Topicalization

(465) This book you should read.

- Left dislocation

(466) This book, it has the recipe in it.

- Right dislocation

(467) You should go see it, that movie.

(468) Jo doesn’t like it, my hat.

(469) *I suppose Jo doesn’t like it, my hat.

- Tag question formation.

(470) The square root of nine is three, is it?

(471) John eats pork, doesn't he?

(472) *I discovered that John eats pork, doesn't he?

Green (1976) also discusses the following phenomena, collected from different sources:

- Evidential *indeed*:

(473) Indeed, languages must have nasal assimilation rules.

(474) *Sydney regrets that indeed, languages must have nasal assimilation rules.

- Exclamatory Inversion

(475) Boy, are we in for it!

(476) *He discovered that boy, was I in over my head.

- *Lo and behold*

(477) Lo and behold, there was a unicorn among the roses.

(478) *I realized that lo and behold, there was a unicorn among the roses.

- Rhetorical questions

(479) Who can understand *Aspects*? [implying: no one]

(480) *It seems that who can understand *Aspects*.

- *Frankly* (as a speaker oriented adverb, meaning that the speaker is being frank)

(481) Frankly, Bobby Riggs never had a chance

(482) *Bobby realized that frankly, he never had a chance.

It has been noticed that "main clause phenomena" or "root phenomena" are misnomers: in fact, these phenomena do occur in many kinds of subordinate clauses. Below are some examples from Green (1976:384-5):

(483) I knew that never before had prices been so high.

(484) John knew that squatting in the corner was a spotted tree frog.

(485) John wants to win it, and I'm afraid that win it he will.

(486) I claim that very important to the Japanese is the amount of mercury being pumped into their bays.

(487) I guess John didn't come in, did he?

(488) I saw that lo and behold, there was a unicorn in the roses.

(489) We ought to assign Postal, because who can understand *Aspects*?

(490) I'm afraid that frankly, he doesn't have a chance.

What is the explanation for the distribution of the "root phenomena"? Examining many environments of sentence-complement verbs, Hooper and Thompson (1973) distinguished five classes of verbs

Non-factive	Assertive	Class A: *say, report, claim*
		Class B: *suppose, believe, think, guess*
	Non-assertive	Class C: *be (un)likely, doubt, deny*
Factive	Assertive	Class D: *resent, regret, be sorry*
	Non-assertive	Class E: *realize, discover, know*

Table 10. Classification of sentential complement verbs according to Hooper and Thompson (1973)

Verbs of class A are verbs of saying, and their object complements contains reported speech. Verbs of class B are verbs of epistemic attitude. They can be used to describe the speaker's attitude towards the new information given in the complement. Verbs in both of these classes are non-factive and assertive, and the root phenomena are allowed in the complements of these verbs:

Root phenomena with verbs of saying (class A)

(491) Sally plans for Gary to marry her, and he vows that marry her he will.

(492) I exclaimed that never in my life had I seen such a crowd.

(493) Wendy said she opened the window and in flew Peter Pen.

(494) Carol said that most embarassing of all was falling off the stage.

(495) Alice complained that it almost asphyxiated her, that disgusting cigar.

Root phenomena with assertive verbs of epistemic attitude (class B):

(496) Most embarassung of all was falling off the stage, I suppose.

(497) It seems that on the opposite corner stood a large Victorian mansion.

(498) It appears that this book he read thoroughly.

(499) I guess it's a waste of time to read so many comic books, isn't it?

Verbs of class C also include verbs of epistemic attitude. However, these are different from the verbs in class B. Those in class B denote the epistemic modality according to which the complement is true. For example, *I think that p* means that *p* is correct according to my thought; *I guess that p* means that *p* is correct according to my guesses. The meaning of verbs in class C cannot be formulated in this way. For example, *It is likely that p* that means that *p* is possible, but does not denote an attitude according to which *p* is true. Therefore, the verbs of class C are not assertive, and they do not allow root phenomena:

(500) *Kissinger is negotiating for peace, it is likely.

(501) *Sally plans for Gary to marry her, and it's possible that marry her he will.

(502) *It's likely that seldom did he drive that car.

(503) *It's probable that Wendy opened the window and in flew Peter Pan.

Class D includes the factive verbs, that is, verbs that presuppose the truth of their complement. Since the complement is presupposed, it is not asserted:

(504) I regret that I didn't attend the concert.

(505) It is odd that the door was unlocked.

According to Hooper and Thompson (1973), the root phenomena are not felicitous in the complements of factive verbs:

(506) *Sally plans for Gary to marry her, and it bothers me that marry her he will.

(507) *He was surprised that never in my life had I seen a hippopotamus.

(508) *Wendy was sorry that she opened the window and in flew Peter Pan.

(509) *The guide was surprised that beyond the next hill stood a large fortress.

Class E includes verbs that are sometimes called semifactive (Karttunen 1971c). These verbs have a factive usage, but sometimes they can lose their factivity and become assertive. In this use, these verbs allow root phenomena:

(510) I found out that never before had he had to borrow money.

(511) Santa has lost a lot of weight, I notice.

(512) Sally plans for Garry to marry her, and he recognizes that, whether he likes it or not, marry her he will.

(513) I notice that the grant proposal has been approved, hasn't it?

To summarize, the verbs in classes A, B, and E are classified as assertive. Their complements express assertions, and root phenomena occur in the complement. On the other hand, the verbs in classes C and D are classified as non-assertive, and it is claimed that the root phenomena do not occur.

Hooper and Thompson (1973) also notice that many root phenomena are grammatical in nonrestrictive relative clauses (514) and ungrammatical in resrictive relative clauses (515):

(514) This car, which only rarely did I drive, is in excellent condition.

(515) *The car that only rarely I drive is in excellent condition.

Green (1976) criticizes the explanation proposed by Hooper and Thompson (1973). She notices that there are cases in which an assertive environment does not license a root phenomenon. For example, in (516) the nonrestrictive relative clause, classified by Hooper and Thompson (1973) as an assertive environment, does not license VP preposing. There are also cases in which a non-assertive environment does license a root phenomenon. For example, the non-assertive complement of *pretend*

allows root phenomena such as Participle Preposing (517) and Adjective Phrase Preposing (518):

(516) *They say that John wants to win a medal; but that son of a gun, who win it will, doesn't deserve it.

(517) John pretended that standing in the corner was a Tiffany lamp.

(518) We just pretended that very important to her was the question of Myopia's status as a most favored nation.

Green (1976) claims that the assertivity condition cannot account for the acceptability of all the root phenomena and maintains that the various phenomena are sensitive to different syntactic and pragmatic factors. While this is undoubtedly correct – the root phenomena are in fact a collection of rather different constructions – the condition of assertivity proves very helpful in describing the distribution of at least some root phenomena. Two such constructions are complement preposing (used as a definition of assertivity in Hooper (1974), discussed above) and tag questions, used both by Hooper (1974) and in this study as an additional test for assertivity. For other phenomena, an assertive environment may be a necessary condition, but not a sufficient condition.

6.4.2 German(ic) V2

According to Heycock (2006), probably the most researched syntactic root phenomenon is Germanic verb-second, a phenomenon that occurs in all the Germanic languages except English[15]. At least in German, it seems that assertivity is an important factor in the explanation of the distribution of this phenomenon.

In an independent sentence or a main clause in German the verb appears in the second position (519); this phenomenon in German and other Germanic languages is known as verb-second, or V2. In German, this usually does not happen in subordinate clauses, in which the verb typically occupies the last position (520). However, there

[15] Negative adverbs such as *never* trigger a subject-verb inversion in English similar to V2 in other Germanic languages.

are exceptions to this rule, and in some cases subordinate clauses can also have verb-second (521). Syntactically, verb-second in a subordinate clause is accompanied by an obligatory loss of the complementizer. When the complementizer is present, the word order is verb-final (520), and V2 is not possible. When the complementizer is absent, the word order is obligatorily V2 (521).

(519) Sie wolle keine Bücher kaufen.

She wants no books buy.

'She doesn't want to buy any books'

(520) Sie sagte, *(dass) sie keine Bücher kaufen wolle.

She said, that she no books buy want.

'She said she didn't want to buy any books'.

(521) Sie sagte, (*dass) sie wolle keine Bücher kaufen.

She said, that she wants no books buy.

'She said she didn't want to buy any books'.

If a subordinate clause is a complement of a verb, the verb has an impact on the availability of verb-second in the subordinate clause[16]. Not all the verbs allow verb-second in their sentential complement. Meinunger (2006) summarizes the observations in earlier literature regarding the verbs that allow V2 and the verbs that do not.

According to Meinunger, the following classes of verbs license V2 in the subordinate clause:

- Verbs of saying: *sagen* 'say', *antworten* 'answer', *bemerken* 'remark'…
- Evidential verbs: *hören* 'hear', *merken* 'notice', *spüren* 'feel'…
- Verbs of thinking: *annehmen* 'assume', *denken* 'think', *glauben* 'believe'…

[16] In this discussion I treat V2 as the main phenomenon, accompanied by the loss of the complementizer. It is possible to see V2 as dependent on the loss of the complementizer. In this case the question becomes: what verbs allow the loss of the complementizer? The answer would be: only the assertive verbs allow the loss of the complementizer and V2 that comes with it.

- Semi-factive verbs: *wissen* ‘know’, *begreifen* ‘realize’, *beweisen* ‘prove’

On the other hand, the following verbs do not license V2 in the subordinate clause: *ignorieren* ‘ignore’, *vergessen* ‘forget’, *bereuen* ‘regret’, *verheimlichen* ‘hide/conceal’:

(522) Ich bereue, dass ich es nicht sofort gekauft habe.

I regret that I it not immediately bought have.

‘I regret I didn’t buy it right away’.

(523) *Ich bereue, ich habe es nicht sofort gekauft.

I regret I have it not immediately bought.

‘I regret I didn’t buy it right away’.

The difference between the verbs that license verb-second and those that do not can be described in terms of assertivity. All the verbs that allow verb-second are assertive, and they belong to same classes discussed by Hooper and Thompson (1973). The verbs that, according to Meinunger, do not license V2 in their complements, are factive, and therefore not assertive. The verb-second clause structure in German can be seen as an indicator of assertive illocutionary force (Wechsler 1991). That is, only an assertive clause can have this structure.

Gärtner (2002) does not assign the V2 subordinate clause a status of assertion. Instead, he describes the verb-second clauses as having an “assertional proto-force”. If such a clause is used independently, the proto-force is realized as a full assertional force. If such a clause is embedded, the results depend on the kind of the embedding. If a clause with an “assertional proto-force” is embedded with an assertive predicate, the proto-force is “absorbed” by the predicate. If it is embedded with a non-assertive predicate, the resulting sentence is infelicitous.

It is not clear what “proto-force” means exactly. However, the idea of assertional force propagation between two clauses, along with the dependence of the propagation on the embedding type, is similar to my description of projection of assertivity in section 10.1.2 below.

6.4.3 Spanish Subjunctive

The distribution of the subjunctive mood in Spanish and other Romance languages is another syntactic phenomenon that the notion of assertion is helpful in explaining. Descriptive grammars frequently describe indicative as a mood for realized events, and subjunctive as denoting unrealized events. For example, Butt and Benjamin (1988:220) mention that in the majority of the uses of the subjunctive the clause "is not known to be a reality at the time of the sentence". This explanation of the distinction between the indicative and the subjunctive explains examples like the following:

(524) María estudiaba ayer.

Maria studied-IND yesterday.

Maria studied yesterday.

(525) Creo que María estudiaba ayer.

Believe-1SG that Maria studied- IND yesterday.

I think that Maria studied yesterday.

(526) Sé que usted tiene que trabajar mucho.

Know-1SG that you have-IND that work much.

'I know you have to work a lot.'

(527) Cenaremos cuando lleguen los demás.

Have-dinner-1PL-FUT when arrive- SUBJ the other.

'We'll have dinner when the rest arrive'.

(528) No creo que sea verdad.

Not believe-1SG that is-SUBJ truth.

'I don't think it's true'

(529) Dudo que Consuelo sea culpable.

Doubt-1SG that Consuelo is-SUBJ guilty.

'I doubt that Consuelo is guilty'.

However, there are uses of subjunctive that do not fit this description. The subordinate clauses in the following sentences describe events that have happened, yet the verb is in the subjunctive mood:

(530) Me alegro que usted no tenga que trabajar tanto.

Me be-happy that you not have-SUBJ that work so.

I'm happy that you don't have to work so much.

(531) Es maravilloso que estudie tanto.

Is marvellous that study-3SG-SUBJ so.

It's marvellous that she studies so much.

Terrell and Hooper (1974) examine the use of indicative and subjunctive in Spanish, mostly in the complements of sentence-complement verbs. Their goal is to unite the different uses of the subjunctive, those describing unrealized events, such as (527) – (529) , and those that describe events that have happened, as in (530) – (531).

Their observation is that indicative is used in asserted clauses, and subjunctive is used in non-asserted clauses. Examples of asserted clauses include standalone sentences (524) and indirect assertion with an epistemic attitude verb (526). In this case the verb in the complement clause is in the indicative mood.

The complements of verbs of negative epistemic attitude such as *dudar* 'doubt' are neither asserted nor presupposed (529), and the verb is in the subjunctive mood. In some cases, in sentences with emotive attitude verbs such as (530) and (531), the truth of the complement sentence is presupposed, so they are not asserted. In this case the verb in the complement clause is in the subjunctive mood. So what is common in the uses of the subjunctive is the lack of assertion. Sometimes a clause is not asserted because the speaker doesn't think it is true, and sometimes a clause is not asserted because its truth is presupposed.

Terrell and Hooper (1974:490) observe that negation in the main clause can affect the choice of the mood in the complement clause in both directions. For example, when the verb *creer* 'believe, think' is used affirmatively, its complement is asserted and the mood is indicative (532). When the verb is negated, the complement is not

asserted, and the mood is subjunctive (533). The verb *dudar* 'doubt' behaves in the opposite way. When it is used affirmatively, the complement is not asserted, and the mood is subjunctive (534). When it is negated, the complement is asserted, and the mood becomes indicative (535).

(532) Creo que Martín ha leído ese libro.

Think-1SG that Martin has-IND read this book.

'I think that Martin has read this book'

(533) No creo que Martín haya leído ese libro.

Not think-1SG that Martin has-SUBJ read this book.

'I don't think Martin has read this book'

(534) Dudo que Consuelo sea culpable.

Doubt-1SG that Consuelo is-SUBJ guilty.

'I doubt that Consuelo is guilty'.

(535) No dudo que Consuelo es culpable.

Not doubt-1SG that Consuelo is-IND guilty.

'I don't doubt that Consuelo is guilty'.

Some distinctions between indicative and subjunctive are hard to explain in terms of clausal assertion. Mejías-Bikandi (1994:945) observes that words *pocos* 'few' and *sólo* 'only' sometimes license the subjunctive in sentences in which only indicative is possible without these words.

(536) Pocos trabajadores creen que haya que ir a la huelga.

Few workers think that has-SUBJ that go on the strike.

Few workers think that one has to go on strike.

(537) Algunos trabajadores creen que hay/*haya que ir a la huelga.

Some workers think that has- IND/has-SUBJ that go on the strike.

Some workers think that one has to go on strike.

(538) Sólo Pedro cree que haya que ir a la huelga.

Only Pedro thinks that has-SUBJ that go on the strike.

Only Pedro thinks that one has to go on strike.

(539) Pedro cree que hay/*haya que ir a la huelga.

Pedro thinks that has-IND/has-SUBJ that go on the strike.

Pedro thinks that one has to go on strike.

Bolinger (1968) compares the subjunctive/indicative licensing distinction in Spanish and root phenomena in English (discussed in section 6.4.1 above). He observes that the verbs that license indicative in Spanish are those that license the root phenomena in English, and those verbs that license subjunctive in Spanish are those that do not license the root phenomena in English. As noticed by Terrell (1976:236), this makes sense if both distinctions can be explained in terms of assertion: indicative mood and root phenomena occur in assertive clauses. Non-assertive clauses are marked by subjunctive, and root phenomena are not allowed.

In some cases, subjunctive can be used in Spanish in clauses that are usually seen as asserted. Lunn (1989:693) describes the use of the subjunctive in the journalistic genre, in which the subjunctive is used to describe information that is expected to be already known to the audience. In the following example the subjunctive occurs in a non-restrictive relative clause, an environment that is usually considered assertive. The factor here is not grammatical presupposition, but rather the pragmatic marking of old information.

(540) La pareja, que se hiciera famosa por interpretar el papel de marido y mujer en “El pájaro espino”, es en la vida real un matrimonio feliz.

The couple, that self made-SUBJ famous for perform the role of husband and wife in “the bird thorn”, is in the life real a marriage happy.

The couple, that became famous for their role as husband and wife in “The Thorn Birds”, is happily married in real life.

Lunn gives an explanation in terms of “prototype of assertability”. The prototypical assertable information is a new, useful clause that the speaker knows to

be true. Clauses that are different from prototype, such as those denote untrue information, or those that denote old information, are more likely to be expressed by subjunctive.

7 Formulating the licensing condition: semantic negativity

7.1 Illocutionary entailment

As mentioned above, my goal is to develop a condition of *semantic negativity* – which is stronger than the notion of downward monotonicity – and explain the distribution of the NPPs. Semantic negativity is comprised of two components, or sub-conditions: downward monotonicity and a second condition. This additional condition should distinguish between the NPI-licensing environments that are semantically negative and that license the NPPs, and those that are not semantically negative and do not license the NPPs.

The proposed additional condition is *assertivity*, to be formally defined in this section. It will also be shown how the condition of assertivity is combined with downward monotonicity to formally define semantic negativity. The formal apparatus in this section is based on the speech act calculus developed in Searle and Vanderveken (1985) and Vanderveken (1990). The condition of assertivity defined here is a development of the notion of assertivity used in earlier syntactic literature, which has been discussed in chapter 6. The differences between my definition and the earlier definitions are discussed in section 7.3.

Before defining assertivity, it is necessary to introduce notation for assertions. If *p* is a proposition, ASSERT(p) is the speech act of asserting *p*. For example, if *p* is the proposition "it is raining", ASSERT(It is raining) denotes the speech act of asserting "it is raining". An assertion of p, ASSERT(p), is a speech act in which the speaker expresses the claim or belief that *p* holds. According to Stalnaker (1978), ASSERT(p) is a speech act by which proposition *p* is added to the common ground (context).

The definition of assertivity is based on the notion of *illocutionary entailment*[17]. Illocutionary entailment is a relation between speech acts, similar to logical entailment, which is a relation between propositions. Illocutionary entailment is defined as follows (Searle and Vanderveken 1985:78, 130):

[17] Searle and Vanderveken (1985) call this notion 'strong commitment' and reserve the term 'illocutionary entailment' for illocutionary forces. They use the same symbol in both cases.

(541) Let A_1, A_2 be illocutionary acts

A_1 *illocutionary entails* A_2 ($A_1 \Rightarrow_{ILL} A_2$) iff

it is not possible to perform A_1 without thereby performing A_2. That is, when A1 is performed, A2 is performed as well.

7.2 Illocutionary entailment and semantic entailment

It is important to describe the difference between the illocutionary entailment defined above and the regular semantic truth-conditional entailment. It might seem that they are equivalent, that is, that ASSERT(p) $\Rightarrow_{ILL}$ ASSERT(q) iff p $\Rightarrow$ q. In many cases this indeed is correct. For example, proposition (542) entails (543), and assertion of (542) illocutionary entails (543).

(542) I have a cat.

(543) I have a pet.

However, there are a number of cases in which the logical entailment and the illocutional entailment behave differently. One such case involves the presuppositions of a sentence. The notion of presupposition has a number of definitions, with the first one being that of a semantic presupposition (Frege 1892; Strawson 1950). Proposition p semantically presupposes proposition q if both the truth and falsity of proposition p entail the truth of proposition q. A similar formulation is that q is entailed by both p and the negation of p. For example, both (544) and its negation (545) entail (546), so (546) is a semantic presupposition of (544). According to Frege and Strawson, if (546) is false, then (544) does not have a truth value; that is, it is neither true nor false.

(544) Whoever discovered the elliptic form of the planetary orbits died in misery.

(545) Whoever discovered the elliptic form of the planetary orbits did not die in misery.

(546) Someone discovered the elliptic form of the planetary orbits.

Similarly, there are verbs that semantically presuppose the truth of their complements. For example, *regret* is one such verb, since both (547) and its negation (548) entail the truth of the embedded clause *I didn't attend the concert*, and,

therefore, (549) is a semantic presupposition of (547). Such verbs are called *factive* verbs (Kiparsky and Kiparsky 1970).

(547) I regret that I didn't attend the concert.

(548) I don't regret that I didn't attend the concert.

(549) I didn't attend the concert

Stalnaker (1974) uses the term presupposition to define a somewhat different notion, a pragmatic presupposition. His definition of presupposition is as follows (Stalnaker 1974:473): "[a] proposition P is a pragmatic presupposition of a speaker in a given context just in case the speaker assumes or believes that P, assumes or believes that his addressee assumes or believes that P, and assumes or believes that his addressee recognizes that he is making these assumptions, or has these beliefs." In another formulation, a presupposition is what is taken by a speaker to be in the common ground of the conversation.

At first it was assumed that the complement of factive verbs is also pragmatically presupposed; meaning, the complement of factive verbs is not used to introduce information not in the common ground. Then, Karttunen (1971c) introduced a distinction between emotive factives such as *regret* and epistemic factives[18], such as *notice*. The verbs of the latter class can sometimes be used to introduce information which is not presupposed (550). This distinction corresponds to Hooper's class D and class E verbs, of which only the latter class license root phenomena, such as complement preposing (551). Later it was noticed that the emotive factives can also sometimes be used to express non-presupposed information (552), albeit on a more limited scale (Abbott 2000).

(550) I notice that Santa has lost a lot of weight.

(551) Santa has lost a lot of weight, I notice.

(552) We regret to inform you that your insurance policy is hereby cancelled.

[18] The epistemic factive verbs can sometimes lose their semantic presupposition as well (Beaver 2004).

As stated explicitly by Stalnaker (1978), presupposed propositions are not asserted. This is clear from the definitions of both notions: the asserted propositions are added to the common ground and the presupposed propositions are already in the common ground. For example, since (547) presupposes (549), someone asserting (547) does not by that utterance assert (549). In other words, (547) does not illocutionary entail (549), although it does entail it semantically. Presupposed propositions are therefore a case in which the illocutionary entailment behaves differently from semantic entailment: presupposed propositions are semantically entailed, but not illocutionary entailed. If p presupposes q, $p \Rightarrow q$ but $\text{ASSERT}(p) \not\Rightarrow_{\text{ILL}} \text{ASSERT}(q)$. This shows that, the truth-conditional entailment is not stronger than illocutionary entailment.

Presupposition is a case in which the truth conditional entailment holds and the illocutionary entailment does not hold. There are also opposite cases, in which the illocutionary entailment holds and the truth-conditional entailment does not hold. This happens in some sentences expressing positive epistemic attitudes of the speaker. For example, although (553) does not semantically entail (554), asserting (553) illocutionary entails asserting (554). That is, if a speaker asserts (553), by the same sentence he also asserts (554).

(553) I think that it's raining.

(554) It's raining.

Let's look more closely at the two assertions sentences like "I think it's raining" contain. The first assertion is about the speaker: the speaker commits to her believing that it's raining. It can be formulated as : "my state of mind is such that I think that 'It's raining' is true'. The second assertion is about the outside world, and its propositional content is simply "it's raining". The main clause serves as an evidential for this proposition (Simons 2007). This particular evidential, *I think*, signals that the speaker's level of certainty in the truth of the proposition is lower than in the case of an unqualified assertion.

That is, asserting (553) expresses a lesser degree of the speaker's commitment to the truth of the proposition *It's raining* than does asserting that proposition by itself

(554). This can be represented in the speech act calculus as the *strength* of the assertion since, according to Searle and Vanderveken (1985), the speech acts can vary by strength. To represent the different strengths of the assertion, I will use the following notation:

(555) $\text{ASSERT}^{i}(p)$ – the speech act of asserting the proposition p with strength i

When a proposition is asserted by itself, the assertion is made with the standard strength. The choice of the base point for the strength degree scale is arbitrary. I follow Searle and Vanderveken (1985) in denoting the strength in terms of difference from the standard assertion. Therefore, the standard assertion itself is represented as $\text{ASSERT}^{0}(p)$.

When the assertion is introduced by other predicates, the strength may differ. For example, *insist* introduces an assertion stronger than the standard one, and *guess* – an assertion weaker than the standard one. This way, the assertion expressed by (556) can be represented as ASSERT^{-2}(*It's raining*), and the assertion expressed by (557) can be represented as ASSERT^{2}(*It's raining*). Again, the absolute values of the strength could be chosen differently. What matters for the representation is that if $i > j$, then $\text{ASSERT}^{i}(p)$ is a stronger assertion than $\text{ASSERT}^{j}(p)$.

(556) I guess that it's raining.

(557) I insist that it's raining.

Returning to the original examples, we can say that asserting *I think that* p results in a weak assertion that p. The formal representation of this is given in (558) below. As a convention, I will use -1 to represent the strength of the assertion introduced by *think*.

(558) $\text{ASSERT}^{0}(\text{I think that p}) \Rightarrow_{\text{ILL}} \text{ASSERT}^{-1}(p)$.

The two assertions expressed by (553) are independent, and each can be true or false independently of the other. A more typical scenario would be when the speaker thinks something wrong. For example, I can hear some noise from outside that sounds like rain, and say "I think it's raining". If the noise had, in fact, some other source,

then the first assertion is true and the second is false. Sometimes the opposite can occur, when the speaker expresses an opinion opposite to what he actually thinks, and by chance the expressed opinion turns out to be correct. For example, I may hear a noise from outside, and say “I think it’s raining”, although I believe that the noise is not caused by rain. If it turns out that the noise *was* caused by rain, that the second assertion would be true, while the first remains false.

What mechanism gives rise to the second assertion? For an explanation, let’s look at another class of utterances, called by Austin (1962) *performatives*. Some examples of performatives are:

(559) I name this ship the *Queen Elizabeth*.

(560) I promise never to drink again.

(561) I pronounce you man and wife.

What distinguishes performatives from regular assertive sentences is that their effect is not just describing reality or conveying new information. When a speaker utters a performative sentence, an action is performed by the mere fact of the sentence being uttered. For example, when (559) is uttered at a ship naming ceremony by the proper person, the ship is being named *Queen Elizabeth* by the fact of the sentence being pronounced. Similarly, (561) said by a priest or a judge at a marriage ceremony makes the bride and groom a husband and wife.

A typical observation is that a sentence only has a performative in the present tense and with the subject in the first person. For example, (562), in the past tense, and (563), with the subject in the third person, are not performatives. They are regular assertions, and no act of naming is performed by pronouncing them.

(562) I named this ship the Queen Elizabeth.

(563) He named this ship the Queen Elizabeth.

It is important to note that it is not the present tense form of the sentence that can make it a performative, but the interpretation of the tensed verb as describing the

action happening in the present. If the present tense is used to describe a generic action, the performative interpretation is not available:

(564) I promise too many things to too many people.

A number of studies address the question of the status of the performatives and attempt to explain how they function. Bach and Harnish (1979; 1992) claim that performative sentences are first of all assertions, and the performative function is created as an indirect speech act. A similar account is given by Searle (1989), except that he describe the main illocutionary force of the performatives as "declarative", separate from a regular assertion.

Consider, for example, the sentence *I promise that I will come tomorrow*. The primary speech act is the assertion of *I promise that I will come tomorrow*. Since the assertion contains a performative verb with a present tense interpretation and first person subject, a derived speech act occurs, that of promising *I will come tomorrow*.

A similar analysis can be applied to sentences with assertive predicates. *I think it is raining* contains a main assertion of *I think it is raining*. Due to the use of an assertive predicate in first person and present tense[19], a derived speech act occurs, that of asserting *It is raining*. As with performative verbs, the use of an appropriate verb creates another speech act. What is special with assertive verbs is that the derivative speech act is of the same type as the main speech act, namely, assertion.

Therefore, when (553) is asserted, (554) is also asserted as a derived illocutionary act. Since (553) does not entail (554), in this case the illocutionary entailment holds and the semantic entailment does not hold.

7.3 Assertivity as a property of an environment

Using the definition of illocutionary entailment in (541), I proceed to define relative assertivity as a property of a clausal environment. This definition generalizes Hooper's (1974) notion of assertive predicates in a number of ways. First, for Hooper assertivity is a property of a sentential-complement verb. As discussed above, Hooper

[19] The usage of assertive verbs in forms other than first person present tense is discussed in section 8.3.

notes that it is not the verb itself that is assertive, but rather the complement clause. I generalize Hooper's notion of assertivity to apply not only to complements of verbs, but to any clausal environment.

First, I would like to define *positive* assertivity:

(565) x is *positive assertive relative to* z iff

x = z or x is a subclause of z and

$\text{ASSERT}(z) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(x)$, for some assertion strength i

In other words, *x* is positive assertive relative to z if x is a part of z and whenever z is asserted, x is asserted as well. The notion I call positive assertivity corresponds to what Hooper simply calls assertivity. Hooper does not distinguish between verbs expressing negative assertion, such as *doubt* or *deny*, and predicates expressing a non-assertion, such as *be likely*. These two kinds are both considered by her to be non-assertive. To distinguish between these two classes I introduce the notion of *negative assertivity* with the following meaning: *x* is negative assertive relative to z if x is a part of z and whenever z is asserted, ¬x is asserted as well:

(566) x is *negative assertive relative to* z iff

x is a subclause of z and

$\text{ASSERT}(z) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(\neg x)$, for some assertion strength i

An environment is assertive if it is either positive assertive or negative assertive:

(567) x is *assertive relative* to z iff

x is *positive assertive relative* to z or

x is *negative assertive relative* to z

Since my definition of assertivity includes negative assertivity in addition to positive assertivity, there are some environments, such as the complement of *doubt*, that I consider *assertive* and Hooper classifies as non-assertive. Another difference between my definition and Hooper's is that in my definition assertivity of a clause *x* can be relative to any clause *x* is contained in, while in Hooper's definition the assertivity of a subordinate clause is always with respect to the entire sentence.

The notion of assertivity is reflexive: a clause is always positive assertive relative to itself; that is, ASSERT(x) $\Rightarrow_{ILL}$ ASSERT (x). On the other hand, some subordinate clauses are assertive relative to the main clause and some are not, depending on the kind of the subordination.

Some examples follow:

(568) I think that *it's raining*.

As mentioned above, asserting *I think that it's raining* illocutionary entails asserting *it's raining* with a weaker degree of certainty. Therefore, the subordinate clause is assertive.

(569) It is possible that *it's raining*.

Asserting *It is possible that it's raining* is not claiming or expressing a belief that *it's raining*, so the subordinate clause is not assertive.

(570) I doubt that *it's raining*.

I take the sentence *I doubt that it's raining* to mean *I think that it's not raining*. Therefore, the subordinate clause is negative assertive relative to the main clause.

(571) If *it's raining*, we should take an umbrella.

When a speaker asserts (571), neither *it's raining* nor *it's not raining* is asserted, so this subordinate clause is not assertive.

(572) I'm glad that *it's raining*.

The proposition expressed in the subordinate clause is entailed by the main sentence, but it is also presupposed. We have seen above that a presupposed proposition is not assertive, so this clausal environment is not assertive.

7.4 Downward monotone clauses

The definition of assertivity developed above is made in terms of clauses. Downward monotonicity is usually defined in terms of environments. In order to conveniently combine downward monotonicity and assertivity I would like introduce a definition of downward monotonicity that applies to a clause. This way a clause can be

examined both for assertivity and downward monotonicity, as shown in the next section.

Let us consider a simple sentence with a subject, verb and object (573). Sentential negation makes all these environments downward monotone:

(573) I didn't eat apples.

(574) I didn't eat *fruits* => I didn't eat *apples*.

(575) I didn't *eat* apples => I didn't *devour* apples.

(576) *Students* didn't eat apples => *Tall students* didn't like apples.

This is not necessarily the case with other words introducing downward monotonicity. For example, the quantifier *few* in the subject makes the verb and the object positions downward monotone. However, since it is part of the subject, the subject position remains upward monotone:

(577) Few people ate apples.

(578) Few people ate *fruits* => few people ate *apples*.

(579) Few people *ate* apples => few people *devoured* apples.

(580) *Students* ate apples =/> *Tall students* ate apples.

Some words create downward monotone environments in some part of the clause. The quantifier *every* makes its restrictor downward monotone, leaving the other environments upward monotone:

(581) Every student ate an apple.

(582) Every *student* ate an apple => every *tall student* ate an apple.

(583) Every student ate a *fruit* =/> every student ate an *apple*.

(584) Every student *ate* a fruit =/> Every student *devoured* a fruit.

The negative polarity particles are licensed by negation and the quantifier *few*, but not by *every*. To account for this fact, I define the clause as downward monotone if its

main predicate position is downward monotone. In verbal clauses, the main predicate position is the verb position. The formal definition is as follows:

(585) A clause *x* is *downward monotone* (DM) relative to *z* if the predicate position of *x* is downward monotone in *z*.

The verb position is downward monotone in (573) and (577), but not in (581). Therefore, this definition establishes the clauses in (573) and (577) as downward monotone (relative to themselves), and the clause in (581) as not downward monotone.

7.5 Formal proposal: semantic negativity = downward monotonicity + assertivity

In section 6.1 above I showed the motivation for assertivity as an additional licensing condition for the NPPs. After formally defining assertivity, it is also time to formally define the licensing condition. The licensing condition is a combination of downward monotonicity and assertivity, and I call such a combination *semantic negativity*. This term reflects the fact mentioned above that all such environment feel negative.

The definition of downward monotonicity of a clause was presented in (585) above and is repeated here for convenience:

(586) A clause *x* is *downward monotone* (DM) relative to *z* if the predicate position of *x* is downward monotone in *z*.

The definition of assertivity in (587) is equivalent to (567):

(587) x is *assertive relative* to a z iff

x = z or x is a subclause of z, and for some assertion strength i,

$\text{ASSERT}(z) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(x)$ or $\text{ASSERT}(z) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(\neg x)$

A clause x is semantically negative relative to z if it is downward monotone relative to z, and it is assertive (positive or negative) relative to z:

(588) x is *semantically negative relative* to z iff

x = z or x is a subclause of z and
x is DM relative to z and
x is assertive relative to z

(589) x is *semantically negative* iff there exists z such that x is semantically negative relative to z.

Finally, the licensing condition:

(590) NPPs are licensed in a host clause *x* if *x* is *semantically negative*.

Section 8 shows how the condition of semantic negativity applies to different kinds of environments and to what extent its predictions are confirmed by the language data. The rest of this chapter explains a number of aspects related to the licensing condition.

7.6 Identifying the host clause

The host clause of an NPP is the clause in which the NPP occurs. When an NPP occurs in an embedded clause, the host clause is the smallest clause containing the NPP. The negativity of the outside clause does not license NPPs in the inner clause. For example, in (591) the NPP *either* is not licensed unless the embedded clause is negative. This is despite the fact that the main clause is negative.

(591) Some people don't like pizza. People [that *(don't) like pasta *either*] shouldn't go to this restaurant.

There are cases in which the identification of the host clause is not obvious. The NPPs usually occur at the end of the clause. In some cases, when an embedded clause occurs at the end of the main clause, and the NPP follows, it may not be clear whether the host clause of the NPP is the main clause or the embedded clause, as in the example below:

(592) I don't have friends who don't like TV *either*.

The NPP *either* requires an antecedent clause, and the host clause is in presented as adding to the antecedent clause. Depending on the antecedent clause, the NPP in (592) can belong either to the embedded clause or the main clause. The following examples demonstrate these two options, in (593) *either* belongs to the main clause, and in (594) *either* belongs to the embedded clause.

(593) Bill doesn't have friends who don't like TV, and [I don't have friends [who don't like TV] *either*].

(594) I have friends who don't like movies, but [I don't have friends [who don't like TV *either*]].

The aspectual particles do not require an antecedent clause; instead, the host clause is contrasted with the situation in the past. This makes the sentence (595) with *anymore* ambiguous. The host clause, that is, the clause contrasted with the past, can be the main clause or the embedded clause, as demonstrated by (596) and (597), respectively.

(595) I don't think he lives in Palo Alto *anymore*.

(596) I used to think he lives in Palo Alto, but I don't think [he lives in Palo Alto] *anymore*.

(597) He used to live it Palo Alto, but I don't think [he lives in Palo Alto *anymore*].

The licensing condition of semantic negativity applies in all cases to the host clause of the NPP, whether it is the main or the embedded clause.

7.7 Tests for assertivity

One problem with the proposed definition of semantic negativity arises from the fact that the definition of assertion is not very formal. In some cases it is not clear from definition alone whether a clause is asserted or not. Assertivity, which is one component of semantic negativity, is defined based on illocutionary entailment, which, in turn, is based on assertion. To address this issue, I describe a number of tests for assertivity that can help determine whether a certain environment is asserted or not.

7.7.1 Tag questions

Short questions of the kind shown in the following example are called *tag questions*.

(598) She made us proud, didn't she?

(599) Ed didn't read it, did he?

The most common kind of tag questions, and the one that is the most discussed, is that of reverse polarity tag questions. For this class of tag questions, if the main clause is positive, the tag is negative (598), and vice versa (599). This fact led to using the polarity of the tag question as a test for the polarity of the main clause (Klima 1964); if the tag clause is positive, it is a sign that the main clause is negative, and if the tag clause is negative, it is a sign that the main clause is positive. This test shows, for Klima, that sentences with negative adverbs such as *never* are negative, since the appropriate question tag is positive (600). On the other hand, sentences with negative verbs such as *reject* are positive, since the appropriate question tag is negative (601):

(600) Writers will never accept suggestions, will they?

(601) Publishers will reject suggestions, won't they?

Huddleston and Pullum (2002:820) use this test to show that sentences with *few* are negative:

(602) Few good drivers ignore signs, do they?

The intuitions regarding the grammaticality of tag questions with sentences containing the words *few* and *rarely* vary among speakers.

(603) Few people came to the party, ?did they/*didn't they?

One thing seems sure: to the extent that the tag questions are possible with such sentences, they are positive and not negative. This shows that sentences with *few* and *rarely* behave like negative sentences.

The studies that use the reverse polarity tag questions are aware of the existence of same-polarity tag questions, but claim that such tag questions are rare and are

characterized by a special intonation. However, recent studies have shown that same-polarity tag questions are actually quite common, especially in spoken speech (Kimps 2007). The positive-positive tag questions occur both in British English (604) and American English (605), though they are more frequent in the former than in the latter (Tottie and Hoffmann 2006). The negative-negative tag questions (606) are nonexistent in American English.

(604) You're going to write Shirley, are you? [UK]

(605) So this is the letter he sent you, is it? [US]

(606) Yes, they don't come cheap, don't they? [UK].

Moreover, the tag questions, including the reverse polarity tag questions, have a variety of usages and intonations (Ladd 1981; Tottie and Hoffmann 2006; Kay 2002). Among the reverse polarity tag questions two main intonations are distinguished. The first is characterized by a falling intonation. In this case a reply is not expected. The second is characterized by a rising intonation, and in this case, the sentence is less assertive and a response is more expected. The distinction can be demonstrated by the following example (from Coates (1996), cited in (Tottie and Hoffmann 2006)):

(607) [Topic: Friend's mother fainting in the street]

> Karen: I think if you're with someone who suddendly falls over| if nothing else you'd get into a restaurant or somewhere where you could sit down| \wouldn't you? | /wouldn't you? . well I think \I would|

Ladd (1981) describes the main distinction between the two kinds of the tag questions in other terms. According to him the main distinction is not between clauses with the rising intonation and the clauses with a falling intonation, but rather between what he calls 'nuclear tag questions', which have a pause between the main clause and the question, and 'postnuclear tag questions', which do not. While nuclear tags do often have a falling intonation, and postnuclear tags do generally have a rising intonation, the opposite possibility also exists. One syntactic difference between the two is the use of *even*, which can only be used with nuclear tag questions:

(608) He didn’t even vote for Reagan, did he? [only OK as a nuclear tag question]

Since the reverse polarity tag questions can be used with a variety of intonations, the criterion of ‘special intonation’ is not sufficient to distinguish the same polarity tag questions from reverse polarity tag questions. Therefore, using the polarity of the tag clause as a test for the polarity of the main clause is not completely accurate.

The connection between the tag questions and assertivity was investigated by Hooper (1974:12). In her formulation, “a tag question may be formed from the main assertion of a sentence, if it is a speaker assertion about which the speaker may express doubt”. This explains tag questions referring to complements of weak assertives predicates:

(609) I think this car needs a tune-up, doesn’t it?

(610) I suppose the Yankees will lose again this year, won’t they?

Tag questions are infelicitous when the predicate is not assertive:

(611) *It’s possible we’ll be arriving on time, won’t we?

The condition of ‘speaker assertion’ excludes the complements of assertive predicates when the subject is not in the first person of the present tense. Examples from Kay (2002:477):

(612) *Mary doesn’t think he’s here, is he?

(613) I don’t think he’s here, is he?

In weak assertion sentences, both the main and the subordinate clause can license tag questions. Referring to a main clause is usually pragmatically illogical, since the tag questions seeks addressee’s confirmation, and usually the speaker has more information about their own mental state than the addressee. However, a special context, such as if a speaker is “an epistemologically challenged psychiatric patient” (Kay 2002:478), does allow such questions:

(614) I don’t think my mother really loved me, did she?

(615) I don’t think my mother really loved me, do I?

These facts led Cristofaro (2003) to suggest the tag questions as a test for assertivity.

It is important to note that assertivity is a *necessary* condition for tag questions, but not a sufficient condition. If a tag question can be formed for a clause, we can conclude that the clause is assertive. If a tag question cannot be formed, either the clause is not assertive, or the tag questions cannot be used for some other reason.

This test shows that the complement of *doubt* is assertive:

(616) But since I couldn't find any schemas for this solution I doubt it's possible, is it?

7.7.2 Agreeing

If a clause was asserted, it can be agreed with or denied in later discourse. Therefore, to check whether a clause was asserted, we can check whether it can be agreed with or denied. Denial, however, will not be as good a test as agreeing. The reason is that a sentence can contain not only asserted clauses, but also presupposed clauses. Such clauses can be denied, but cannot be agreed with. A third type of clause are those that are neither asserted nor presupposed. Usually such clauses can be neither agreed with nor denied. These properties are summarized in the following table:

act \ status of the clause	asserted	presupposed	neither
can be agreed with	+	-	-
can be denied	+	+	-

Table 11. Distinguishing between clauses that are asserted, those that are presupposed, and those that are neither asserted nor presupposed.

Accordingly, the possibility of agreeing to a clause can be used as a test of assertivity. If after F(x) is asserted it is possible to agree that x, then x has been asserted by the speaker when F(x) was asserted. This establishes x as is positively assertive in F(x). If after F(x) is asserted it is possible to agree that $\neg x$, then $\neg x$ has been asserted when F(x) was asserted. This shows that x is negatively assertive in F(x). Some examples are given below:

Conditional sentences:

(617) - If the printer doesn't work, the technician will fix it today.

- I agree, he will. / No, he won't.

- #I agree, it doesn't. /#I disagree, it does work.

This shows that while the main clause is assertive, the antecedent of a conditional is not.

Negative implicative verbs:

(618) - He refused to come to the meeting.

- That's true, he didn't come.

In this case the subordinate environment is negative assertive.

Negative implicative constructions:

(619) - This machine is too wide to fit in this room.

- I agree, it doesn't fit.

In this case the subordinate environment is also negative assertive.

7.7.3 Answering a question

Simons (2007) introduces the following test for "main point content". Suppose there is a question whether *p* is true or false. If a sentence F(p) can be used to answer such a question, than *p* is its "main point".

(620) - Is it raining?

- It isn't.

- I think it is.

- I hope it is.

The first two responses indeed answer the question, the first gives a negative answer, and the second - a weak positive answer. The third response expresses the speaker's attitude towards a possible answer, but does not give an answer.

This test is in fact a test for assertivity, and a sentence F(p) can be used to directly provide an answer to such a question iff *p* is assertive in F(p). If p is negatively

assertive in F(p), F(p) is providing a negative answer, and if p is positively assertive in F(p), F(p) is providing a positive answer.

7.7.4 Generalized Moore's paradox

It has been noticed that sentences like the following cannot be asserted without creating a self-contradiction:

(621) It is raining and I don't believe it's raining.

This observation is known as Moore's paradox. Interestingly, although asserting (621) is self-contradictory, the proposition expressed in (621) is not a logical contradiction, for it can be true. Indeed, it is possible that it is raining and for some reason I believe it is not raining. However, I cannot *claim* simultaneously that it's raining and I don't believe it. For when I claim that it's raining I also express my belief that it *is* raining, and the second conjunct contradicts it.

It is possible to devise a test for semantic negativity by generalizing this paradox. We observe that it is not possible to assert X and ¬X without creating a contradiction. Therefore, if one *can* assert "X and F(X)", then F(X) does not assert ¬(X). Using the terminology introduced above, we can formulate the following condition:

(622) One can assert "X and F(X)" without creating a contradiction similar to Moore's paradox, iff X is not negatively assertive in F(X).

The tests for assertivity are used in the next section to help determine which environments are semantically negative and which are not.

8 Examining the environments

8.1 Introduction

In this section I survey the various environments that are known to license negative polarity items. For each environment, I calculate the prediction of the licensing condition of semantic negativity regarding the distribution of the negative polarity particles, and examine whether the prediction is correct.

I use different methods to determine whether the assertivity condition holds. In some cases, the definitions of assertion and illocutionary entailment are used directly. In other cases, I make use of tests for assertivity described in section 7.6.

The condition of downward monotonicity is examined directly. I use pairs of predicates one of which entails the other – such as *walk* and *move*, or *have a cat* and *have a pet* – to check whether the direction of entailment in a given environment stays upward, or is reversed downward. Testing for monotonicity is less important than checking for assertivity, the reason being that the main contribution of this research is the condition of assertivity, to be added to the established condition of downward monotonicity. In those cases that the NPPs are licensed in environments which are not downward monotone, the other NPIs are licensed there as well, and such environments are problematic for understanding NPIs in general, and not just NPPs in particular.

With respect to the licensing condition of semantic negativity proposed above, the NPI licensors are divided into three categories as follows:

- licensors creating a downward monotone environment in the same clause in which they appear
- licensors creating a downward monotone environment in an assertive subordinate clause
- licensors creating a downward monotone environment in a non-assertive subordinate clause

These three categories of licensors are discussed in the following three subsections.

8.2 Same-clause NPI-licensors

The first category includes the licensors reversing the monotonicity of the clause in which they appear. The expressions in this class are syntactic negation, *few, rarely* and *only*. Consider a sentence with *few* (624). Its predicate position is downward monotone, as we will see below, and the reason for this is the word *few*; with quantifiers such as *many* or *some* or determiners like *these*, the predicate position is upward monotone (625). The NPI licensor creates the DM environment in the predicate position of the same clause in which it appears and no subordination is created.

(623) They didn't have lunch.

(624) Few tourists are here *yet*.

(625) Many/some/these tourists are here.

(626) Publishers will usually reject suggestions, and writers will scarcely/hardly/ rarely accept them, *either* (Klima 1964:261).

We observed above that the notion of assertivity is reflexive, that is, a clause is always assertive relative to itself. As a consequence of this fact, whenever the downward monotonicity is created in the predicate of the same clause in which the NPI licensor occurs, such a clause is semantically negative. Therefore, the proposed licensing condition predicts that in such cases the negative polarity particles are licensed.

Let's see how the condition of semantic negativity applies formally to environments of this kind. Consider a simple sentence with *few* in the subject position, consisting of a single clause denoted by *x*:

(627) $[_x$Few people came$]_x$.

A clause *x* is semantically negative iff there exists a clause *z* such that *x* is semantically negative relative to *z*. In (627) there is only one candidate for *z*, namely, *x* itself. Therefore, we have to check whether *x* is semantically negative relative to *x* itself.

A clause *x* is semantically negative relative to *z* iff *x* is downward monotone relative to *z* and *x* is assertive relative to *z*. Let us examine the assertivity first. A clause *x* is assertive relative to *z* iff $\text{ASSERT}(z) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(x)$ or $\text{ASSERT}(z) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(\neg x)$, for some assertion strength *i*. This definition is reflexive, as for every clause *x*, $\text{ASSERT}(x) \Rightarrow_{\text{ILL}} \text{ASSERT}^{0}(x)$, so every clause is assertive relative to itself. Therefore, the clause *x* in (627) is assertive relative to *x*.

We can now proceed to examining the downward monotonicity. A clause *x* is downward monotone relative to *z* iff the predicate position of *x* is downward monotone relative to *z*. In (627) the predicate position is the position of the verb *came*. This position is indeed downward monotone in this sentence. This can be demonstrated by the validity of the following entailment, in which the denotation of the verb in the premise, *moved*, is a superset of the denotation of the verb in the conclusion, *jumped*:

(628) Few people *moved*. $\Rightarrow$

(629) Few people *jumped*.

Therefore, the clause *x* is downward monotone relative to *x* itself. Since *x* is both downward monotone relative to *x* and assertive relative to *x*, by definition of semantic negativity *x* is semantically negative to *x*. Since there is a clause *z* such that *x* is semantically negative relative to *z*, *x* is semantically negative. The licensing condition of semantic negativity holds, and the negative polarity particles are predicted to be licensed.

A similar prediction is given for a sentence in which *few* occurs in a direct object position, such as the following:

(630) $[_{x}$John visits few friends anymore$]_{x}$.

Let's take a closer look at how the condition of semantic negativity applies to (630). A clause *x* is semantically negative iff there exists a clause *z* such that *x* is semantically negative relative to *z*. As in (627), there is only one candidate clause, namely, *x*, so we examine the semantic negativity of x relative to itself. As previously

discussed, assertivity is reflexive, therefore *x* is assertive relative to itself. It remains to be seen whether *x* is downward monotone relative to itself.

A clause *x* is downward monotone relative to *z* iff the predicate position of *x* is downward monotone relative to *z*. In (630) the predicate position is the position of the verb *visits*. To examine the downward monotonicity of this position we can use the verb *meet*, which is a hypernym of the verb *visit* (if John visited Bill, then John met Bill, but not vice versa). We examine whether the entailment from (631) to (632) holds. In this entailment the conclusion is the original sentence; the verb *visits* is replaced with its hypernym *meets* in the premise:

(631) John *meets* few friends anymore. ⇒

(632) John *visits* few friends anymore.

This entailment indeed holds, and the predicate position of the clause *x* is therefore downward monotone relative to the clause. Hence, the clause *x* is downward monotone relative to itself. Since it is also assertive relative to itself, it is semantically negative relative to itself. Therefore, the clause *x* is semantically negative, and the negative polarity particles are predicted to be licensed in this clause.

Another case of downward monotonicity being created in the predicate position of a clause is that of a clausal negation. Let us consider such an example:

(633) $[_x$I don't like tomatoes$]_x$.

We examine the semantic negativity of the clause *x* to see whether the licensing condition predicts that the NPPs are licensed. This sentence contains only one clause, so we examine the semantic negativity of *x* relative to *x* itself. We have seen above that a clause is assertive relative to itself, therefore, *x* is assertive relative to itself. It remains to be seen whether *x* is downward monotone relative to itself.

To examine for downward monotonicity, we check if the predicate position of *x* is downward monotone in *x*. The predicate position is the position of the verb *like*. The predicate position is downward monotone if entailments like the following hold:

(634) I don't *like* tomatoes. =>

(635) I don't *adore* tomatoes.

In this pair of sentences the denotation of the verb in the premise (634), *like*, is a superset of the denotation of the verb in the conclusion (635), *adore*. This entailment holds, hence the predicate position of *x* in (633) is indeed downward monotone relative to *x*, and the clause *x* is downward monotone relative to itself. Since *x* is also assertive relative to itself, it is semantically negative relative to itself, so it is semantically negative. Therefore, according to the licensing condition, the NPPs are predicted to be licensed in *x*, and similar clauses with clausal negation.

It can similarly be shown that a clause with *rarely* such as (636) is semantically negative.

(636) $[_x$ John rarely visits his friends$]_x$.

The clause *x* is assertive relative to itself, as shown above. The predicate position of *x* is downward monotone relative to *x*, as the following entailment demonstrates:

(637) John rarely *meets* his friends. =>

(638) John rarely *visits* his friends.

The clause *x* is therefore semantically negative relative to itself, hence it is semantically negative, and the negative polarity particles are predicted to be licensed.

Sometimes an NPI-licenser creates a downward monotone environment within a clause, without making the predicate position of the clause downward monotone. Such is, for example, the word *without*. Let us examine a sentence in which the word *without* is used with a non-clausal argument:

(639) $[_x$ She was singing <u>without</u> *a microphone*$]_x$.

Negative polarity items like *any* are licensed by *without*:

(640) She was singing <u>without</u> *any* help.

The argument of *without* is downward monotone, as the following entailment demonstrates:

(641) She was singing without *accompaniment*. =>

(642) She was singing without *piano accompaniment*.

However, to examine the downward monotonicity of the clause *x* in (639) we need to check if the predicate position of *x* is downward monotone in *x*. The predicate position is the position of the verb *singing*. This position is not downward monotone, since the following entailment does not hold:

(643) She was *singing* without a microphone. =/>

(644) She was *caroling* without a microphone.

This shows that the clause *x* is not downward monotone relative to *x*, so *x* is not semantically negative relative to *x*. Since (639) only has one clause, the only clause relative to which *x* could be semantically negative is *x* itself. Since *x* is not semantically negative relative to *x*, *x* is not semantically negative, hence the negative polarity particles are predicted not to be licensed in *x*. This prediction is borne out, as the following examples demonstrate:

(645) *I was singing without a microphone, and she was singing without a microphone, *either*.

(646) *I was singing without a microphone, and *neither* was she.

(647) *I am singing without a microphone *yet/anymore*.

As shown in this section, if an NPI-licenser makes the predicate position of the clause in which appears downward monotone, such a clause is also semantically negative, and the negative polarity particles are predicted to be licensed. In the examples discussed in this section this prediction turned out to be correct. Some cases in which the prediction is not correct, such as clauses with *only*, are discussed in section 8.8.1 below.

8.3 Assertive subordinate clauses

The second category of licensors are those creating a downward monotone environment in the predicate position of a subordinate clause, with the subordination

of the type that makes the subordinate clause assertive. In this case the subordinate clause is semantically negative relative to the main clause, since it is assertive relative to the main clause and its predicate position is downward monotone relative to the main clause.

One example of a licensor of this class is *doubt*. I demonstrate how the analysis applies formally on the following example:

(648) $[_y$I doubt that $[_x$he will come$]_x]_y$.

A clause *x* is semantically negative iff there exists a clause *z* such that *x* is semantically negative relative to *z*. In (648) there are two candidates for the role of *z*, namely, *x* itself, and the main clause of the sentence *y*. We have to check whether *x* is semantically negative with respect to at least one of these two candidate clauses.

First, let's take *z* = *x*, that is, we examine the clause *x* relative to itself. We need to check whether *x* is semantically negative relative to *x*. A clause *x* is semantically negative relative to itself if it is assertive relative to itself and downward monotone relative to itself.

We have seen above that assertivity is reflexive, that is, every clause is assertive relative to itself. Therefore, the clause *x* is assertive relative to *x*. We can now proceed to examining the downward monotonicity. A clause *x* is downward monotone relative to *x* if its predicate position is downward monotone relative to *x*. In (648) the predicate position in *x* is the position of the verb *come*. However, the clause *x* is a simple positive clause and its verb position is not downward monotone. This can be shown by the lack of validity of the following entailment:

(649) He will *move*. =/>

(650) He will *jump*.

This position is, in fact, upward monotone, as the following entailment demonstrates:

(651) He will *jump*. =>

(652) He will *move*.

Since the predicate position of *x* is *not* downward monotone relative to *x*, the clause *x* is not downward monotone relative to *x*. Therefore, the second condition required for the clause *x* to be semantically negative relative to *x* does not hold, and the clause *x* is, in fact, not semantically negative relative to *x*.

Let's now take *z* = *y*, that is, the entire sentence. We now examine whether *x* is semantically negative relative to *y*. A clause *x* is semantically negative relative to *y* iff it is assertive relative to *y* and downward monotone relative to *y*. A clause *x* is assertive relative to *y* iff $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(x)$ or $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(\neg x)$, for some assertion strength *i*.

In section 7.2 above I analyzed clauses of the kind *I think that p* as expressing a weak assertion that *p*. This was given the following formulation in (558): $\text{ASSERT}^{0}(\text{I think that p}) \Rightarrow_{\text{ILL}} \text{ASSERT}^{-1}(\text{p})$. Similarly, I would like to analyze the verb *doubt* as introducing a weak assertion that its complement is false. In other words, I analyze *I doubt that p* as *I think that not p*. Formally, this can be expressed as follows:

(653) $\text{ASSERT}^{0}(\text{I doubt that p}) \Rightarrow_{\text{ILL}} \text{ASSERT}^{-1}(\neg \text{p})$

In (648), the clause *y* is *I doubt that x*. Using the analysis formulated in (653), we obtain $\text{ASSERT}^{0}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^{-1}(\neg x)$. Therefore, the second disjunct of the definition of assertivity is true, and the clause *x* is assertive relative to *y*. This is also consistent with Simons' (2007) analysis of clauses beginning with *I think*. In her analysis, in sentences with *I think that x* the main assertion is the subordinate clause *x*, and *I think* functions as an evidential for the main claim. In the case of *doubt*, the assertion of *I doubt that x* is ¬*x*, with the same evidentiality as with *think*.

The tests for assertivity discussed in section 7.6 also lead to the conclusion that *x* is assertive relative to *y*. The subordinate clause of *doubt* can license tag-questions:

(654) I doubt it is possible, is it?

It is possible to agree with what is claimed in the subordinate clause:

(655) - I doubt it's possible.
- I agree, it isn't.

It is possible to use this construction to answer a question:

(656) - Is it possible?

- I doubt it is.

The test of generalized Moore's paradox gives the same result, as the following sentence cannot be asserted without creating a self-contradiction.

(657) It is raining and I doubt it's raining.

All the tests show that the subordinate clause of *doubt* is assertive relative to the main clause, and, more specifically, negative assertive relative to the main clause.

Having established that *x* is assertive relative to *y*, the next step is to examine whether *x* is downward monotone relative to *y*. A clause *x* is downward monotone relative to *y* iff the predicate position of *x* is downward monotone relative to *y*. In (648) the predicate position of *x* is the verbal position, and this position is indeed downward monotone relative to *y*. This can be demonstrated by the validity of the following entailment, in which the denotation of the verb in the subordinate clause in the premise, *move*, is a superset of the denotation of the verb in the conclusion, *jump*:

(658) I doubt that he will *move*. ⇒

(659) I doubt that he will *jump*.

Therefore, *x* is downward monotone relative to *y*. We have also observed above that *x* is assertive relative to *y*. Since *x* is assertive relative to *y* and downward monotone relative to *y*, *x* is semantically negative relative to *y*. Since *x* is semantically negative relative to *y*, *x* is semantically negative.

We come to the conclusion that in (648) the clause *x* is semantically negative according to the definitions above. According to the licensing condition, the NPPs are licensed in semantically negative clauses, so the NPPs are predicted to be licensed in the clause *x*. This prediction is borne out:

(660) It didn't rain yesterday, and I <u>doubt</u> it will rain today, *either*.

In the examples above the verb *doubt* was used in first person present tense. Other uses turn out to be more problematic. The reason for the difference is that assertive

verbs such as *think, believe, doubt* create an assertive environment only if they are used to describe the here-and-now, in first person present tense. Other usages, such as third person or past tense, create a non-assertive environment. This is similar to other performative verbs, which create a secondary illocutionary act only when used in first person and present tense.

Let us formally examine the differences between *think* with a first person subject, as in (661), and *think* with a third person subject, as in (662).

(661) $[_y$ I <u>think</u> that $[_x$ it's raining$]_x]_y$.

(662) $[_y$ My friend <u>thinks</u> that $[_x$ it's raining$]_x]_y$.

As demonstrated in section 7.2 above, the subordinate clause *x* in (661) is assertive. The reason is the following illocutionary entailment, formulated in (558) and repeated here for convenience:

(663) ASSERT^0(I think that p) $\Rightarrow_{\text{ILL}}$ ASSERT^{-1}(p)

In this case, ASSERT^0(I think that it's raining) $\Rightarrow_{\text{ILL}}$ ASSERT^{-1}(It's raining). Asserting (661) expresses a weak assertion by the speaker that it's raining. This is not the case with (662). Asserting (662) does not express an assertion by the speaker that it is raining. A clause *x* is assertive relative to *y* iff $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^i(x)$ or $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^i(\neg x)$, for some assertion strength *i*. In (662), there is no strength *i* such that asserting y illocutionary entails that x or ¬x with strength *i*. Therefore, in (662), the clause *x* is not assertive relative to *y*.

The difference in assertivity can be demonstrated by tag questions, which are infelicitous when the verb *think* is in third person (Kay 2002:477):

(664) *Mary doesn't <u>think</u> he's here, is he?

(665) I don't <u>think</u> he's here, is he?

We have seen above that the verb *doubt* licenses the NPPs when used in first person present tense, such as in (666) below. What about *doubt* in sentences like (667) below, in which the verb is not used in first person present tense?

(666) $[_y$ I <u>doubt</u> that $[_x$ it is raining$]_x]_y$.

(667) [$_y$ My friend <u>doubts</u> [$_x$ that it is raining] $_x$]$_y$.

As demonstrated earlier in this section, the subordinate clause *x* in (666) is assertive. The reason is the following illocutionary entailment, formulated in (653) and repeated here for convenience:

(668) ASSERT^0(I doubt that p) $\Rightarrow_{\text{ILL}}$ ASSERT^{-1}(¬p)

In this case, ASSERT^0(I doubt that it's raining) $\Rightarrow_{\text{ILL}}$ ASSERT^{-1}(It's not raining). Asserting (666) expresses a weak assertion by the speaker that it's not raining. This is not the case with (667). Asserting (667) does not express an assertion by the speaker that it is raining. A clause *x* is assertive relative to *y* iff $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^i(x)$ or $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^i(\neg x)$, for some assertion strength *i*. In (667), there is no strength *i* such that asserting y illocutionary entails that x or ¬x with strength *i*. Therefore, in (667), the clause *x* is not assertive relative to *y*.

The subordinate clause *x* in (667) is not assertive relative to y, therefore *x* it is not semantically negative relative to *y*. We have also seen in the analysis of (648) above that *x* is not semantically negative relative to itself. Therefore, in (667) there is no clause *z* such that *x* is semantically negative relative to *z*, so *x* is not semantically negative. Since *x* is not semantically negative, according to the licensing condition of semantic negativity, the negative polarity particles are predicted not to be licensed.

This prediction turns out to be incorrect, as examples of NPPs can be found wherein *doubt* does not express speaker assertion:

(669) Uncle Jack cannot think of any place in the world that he would rather have been and he <u>doubts</u> that anybody else could *either*.[20]

(670) I <u>doubted</u> that she was back *yet*.

(671) I hadn't heard much about the man in 20 years and I <u>doubted</u> that anyone even cared about him *anymore*.

[20] http://www.obxconnection.com/blogs/blog_entry.aspx?BHID=1&MID=10&YID=2006

A possible way to take care of this problem is to expand the definition of assertivity to include the cases above. The first step is to expand the definition of assertion. The regular assertion ASSERT(*p*) expresses the claim or the belief that the speaker at present holds the belief that *p*. We can introduce a notion of assertion relativized with respect to the individual holding the belief and the time at which the belief is or was held (Farkas 1992; Giannakidou 1999). An assertion relative to an individual *d* and a time *t*, denoted as $\text{ASSERT}_{d,t}(p)$, is a speech act in which the speaker expresses the claim or belief that the individual *d* believes/believed in time *t* that *p* holds. The notion of relative assertivity can be modified to use the modified notion of assertion, as follows:

(672) x is *assertive relative* to a z iff

x = z or x is a subclause of z and

$\text{ASSERT}(z) \Rightarrow_{\text{ILL}} \text{ASSERT}_{d,t}(x)$ or $\text{ASSERT}(z) \Rightarrow_{\text{ILL}} \text{ASSERT}_{d,t}(\neg x)$

This way the complement clauses of *doubt* in sentences (669) – (671) can be classified as assertive relative to the main clauses containing the verb *doubt*, and hence semantically negative. In (669) the subordinate clause of *doubt* expresses an assertion relative to Uncle Jack and present; in (670) and (671) the argument of *doubt* expresses an assertion relative to the speaker and the past. All these clauses are therefore semantically negative according to the modified definition of assertivity.

The condition of semantic negativity based on the modified definition of assertivity accounts correctly for the licensing of NPPs with *doubt*. The difference between the original and the modified definitions does not show up in other NPI-licensing environments, so for the sake of simplicity I will use the original definitions for the other environments.

The NPI licensors creating negative implicative environments also belong to the category discussed in this section. The *too*-construction with a sentential complement is one of the licensors of this kind. I demonstrate how the condition of semantic negativity applies to sentences with this construction using the following example:

(673) $[_y$ John was *too* tired $[_x$ to meet Bill$]_x]_y$

We want to examine the prediction of the condition of semantic negativity for the clause *x*. A clause *x* is semantically negative iff there exists a clause *z* such that *x* is semantically negative relative to *z*. In (673) there are two candidates for the role of *z*, namely, *x* itself, and the main clause of the sentence *y*. We have to check whether *x* is semantically negative with respect to at least one of these two candidate clauses.

First, let's take *z* = *x*. In the case we encounter a problem in examining of assertivity of *x*, since the clause *x* does not contain a standalone proposition. We can deal with this issue by modifying the clause to make a proposition that can be examined. One thing missing in clause *x* is an overt subject. Since the implied subject of the event in *x* is John, we make *John* the subject of the proposition. The other problem is that the clause *x* lacks tense. Again, the event described in the clause refers to the past, so we complete the proposition by adding the past tense. Therefore, the clause *x* will be represented by the following proposition

(674) John met Bill.

This is a simple affirmative clause. We have seen above that a simple affirmative clause is assertive relative to itself, but not downward monotone relative to itself. Therefore, *x* is not semantically negative relative to itself.

We can now examine the semantic negativity of *x* relative to *y*. To check whether *x* is downward monotone relative to *y*, we examine the following entailment.

(675) John was too tired to *meet* Bill $\Rightarrow$

(676) John was too tired to *visit* Bill.

The denotation of the verb in the predicate position of *x* in the premise is a superset of the denotation of the verb in the predicate position of *x* in the conclusion. This entailment holds, demonstrating that the clause *x* is indeed downward monotone relative to *y*.

We now examine whether *x* is assertive relative to *y*. A clause *x* is assertive relative to *y* iff $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^i(x)$ or $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^i(\neg x)$, for some assertion strength *i*. In the case of (673), the main sentence *y* entails ¬x, that is, y entails (678):

(677) $[_y$ John was too tired $[_x$ to meet Bill$]_x]_y \Rightarrow$

(678) John didn't meet Bill.

The proposition in (678) is also illocutionary entailed by (677), and *x* is indeed assertive relative to *y*. This conclusion is supported by a number of factors. The cases shown in section 7.2 of semantic entailment without illocutionary entailment involved presuppositions, and (678) is not presupposed by (673). The sentence (673) can be used to answer a question regarding (678), as the following exchange demonstrates:

(679) Did John meet Bill?

- John was too tired to meet Bill.

Since *x* is assertive relative to *y* and *x* is downward monotone relative to *y*, *x* is semantically negative relative to *y*. Therefore, *x* is semantically negative, and the NPPs are predicted to be licensed in this clause.

A similar prediction is given for the clausal complement of *without*. Consider the following sentence:

(680) $[_y$ John left without $[_x$ meeting Bill$]_x]_y$

As with the previous example, the clause *x* does not express a standalone proposition. For the purposes of examining assertivity and downward monotonicity the clause *x* is represented by the clause *John met Bill*. This clause is assertive relative to itself, but not downward monotone relative to itself, so it is not semantically negative relative to itself.

We can now examine the semantic negativity of *x* relative to *y*. To check whether *x* is downward monotone relative to *y*, we examine the following entailment.

(681) John left without *meeting* Bill $\Rightarrow$

(682) John left without *visiting* Bill.

The denotation of the verb in the predicate position of *x* in the premise is a superset of the denotation of the verb in the predicate position of *x* in the conclusion.

This entailment holds, demonstrating that the clause *x* is indeed downward monotone relative to *y*.

We then examine whether *x* is assertive relative to *y*. The clause *y* entails (683), which is the negation of the proposition representing *x*.

(683) John didn't meet Bill.

The clause *y* illocutionary entails (683), since someone asserting (680) indeed also asserts that John didn't meet Bill. Therefore, *x* is assertive relative to *y*. Since *x* is assertive relative to *y* and *x* is downward monotone relative to *y*, *x* is semantically negative relative to *y*. Therefore, *x* is semantically negative, and the NPPs are predicted to be licensed in this clause.

Clausal complements of negative implicative verbs are analyzed similarly. I demonstrate how the condition of semantic negativity applies to sentences with such verbs using the following example with the verb *refuse*:

(684) $[_{y}$ John *refused* $[_{x}$ to meet Bill$]_{x}]_{y}$

Like with the previous example (673), I examine the semantic negativity of *x* relative to *x* itself and relative to *y*. In example (684) we encounter the same problem as with (673), namely, that the clause *x* does not express a standalone proposition, and the definitions of clausal assertivity and downward monotonicity cannot be applied to it directly. I use the same solution proposed above: for the purposes of examining assertivity and downward monotonicity the clause *x* will be represented by the following proposition:

(685) John met Bill.

As demonstrated above, the clause *x* is assertive relative to itself, but not downward monotone relative to itself. Therefore, *x* is not semantically negative relative to itself.

We can now examine the semantic negativity of *x* relative to *y*. To check whether *x* is downward monotone relative to *y*, we examine the entailment from (686) to (687):

(686) John refused to *meet* Bill. ⇒

(687) John refused to *visit* Bill.

It is possible that (686) is true and (687) is false. Such is the case, for example, if John was asked to meet Bill in John's own office, and was never offered to visit Bill. However, in order to check for Strawson-DM, we need to make sure that the presuppositions of the conclusion are satisfied. I suggest that sentences of the type *X refused to Y* presuppose that someone told X to do Y. Therefore we need to examine the entailment above under the condition that someone told John to visit Bill, which is the presupposition of (687). In this case the entailment holds. Indeed, if someone told John to visit Bill, and John refused to meet Bill, we can conclude that John refused to visit Bill. Therefore, the Strawson-entailment from (686) to (687) holds, and the clause *x* is downward monotone relative to *y*.

We now examine whether *x* is assertive relative to *y*. A clause *x* is assertive relative to *y* iff $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(x)$ or $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(\neg x)$, for some assertion strength *i*. In the case of (684), the main sentence *y* entails ¬x, that is, y entails (689):

(688) $[_{y}$ John refused $[_{x}$ to meet Bill$]_{x}]_{y} \Rightarrow$

(689) John didn't meet Bill.

The proposition in (689) is also illocutionary entailed by (684), and *x* is indeed assertive relative to *y*. This conclusion is supported by a number of factors. The cases shown in section 7.2 of semantic entailment without illocutionary entailment involved presuppositions, and (689) is not presupposed by (684). The sentence (684) can be used to answer a question regarding (689), as the following exchange demonstrates:

(690) Did John meet Bill?

- He refused to.

Since *x* is assertive relative to *y* and *x* is downward monotone relative to *y*, *x* is semantically negative relative to *y*. Therefore, *x* is semantically negative, and the NPPs are predicted to be licensed in this clause.

We have seen that the complement clause of negative implicative verbs and negative implicative constructions is an assertive environment, and its predicate position is, in most cases, downward monotone. This means that such an environment is semantically negative, and the NPPs are predicted to occur. In these environments the behavior of the NPPs is again predicted not to be different from NPIs like *any*. This prediction is again borne out.

8.4 Non-assertive subordinate clauses

The third category of NPI licensors are those that create a downward monotone environment in the predicate position of a non-assertive subordinate clause. In this case the subordinate clause is not semantically negative, and the negative polarity particles are not predicted to be licensed.

Such is the case, for example, with an antecedent of a conditional. Let's see how the proposed condition applies to an antecedent *x* of the following conditional sentence:

(691) $[_{y}$If $[_{x}$he comes$]_{x}$, I won't play the guitar$]_{y}$.

A clause *x* is semantically negative iff there exists a clause *z* such that *x* is semantically negative relative to *z*. In (691) there are two candidates for the role of *z*, namely, *x* itself, and the main clause of the sentence *y*. We have to check whether *x* is semantically negative with respect to at least one of these two candidate clauses.

First, let's take *z* = *x*. The clause *x* is assertive relative to itself, due to the reflexivity of assertivity. Since the predicate position of *x* is not downward monotone relative to *x*, one of the conditions for semantic negativity does not hold, and *x* is not semantically negative relative to itself. The full formal examination of such a clause can be found in section 8.3 above in the analysis of sentence (648).

Let's now take *z* = *y*, which is the entire sentence. The antecedent of a conditional is usually considered to be a downward monotone environment, as demonstrated by the direction of entailment between the following sentences[21]:

[21] As noted in Heim (1984), this pattern, known as "strengthening the antecedent", does not always hold. For example, the following entailment does not hold:

(692) If you have a pet, you must notify the landlord ⇒

(693) If you have a cat, you must notify the landlord.

However, the antecedent clause *x* is not assertive relative to *y*. A clause *x* is assertive relative to *y* iff $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(x)$ or $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(\neg x)$, for some assertion strength *i*. However, asserting (691), for example, does not illocutionary entail either *he comes*, or *he doesn't come*. A common analysis of conditional utterances of the type *if A then B* is that they are conditional assertions, asserting *B* in the case that A is true. If *A* is false, nothing gets asserted, and neither A nor ¬A are asserted.

Since *x* is not assertive relative to *y*, one of the conditions for semantic negativity does not hold, and *x* is not semantically negative relative to *y*. Since there is no *z* such that *x* would be semantically negative relative to *z*, *x* is not in a semantically negative environment.

The licensing condition of semantic negativity does not hold, and the negative polarity particles are predicted not to be licensed by the antecedent of a conditional. This prediction turns out to be correct.

Another environment belonging to this category is the restrictor (first argument) of the universal quantifier. I use the following example to demonstrate how the condition of semantic negativity applies to this environment.

(694) $[_{y}$Everyone $[_{x}$who visited John$]_{x}$ liked him$]_{y}$.

A clause *x* is semantically negative iff there exists a clause *z* such that *x* is semantically negative relative to *z*. In (694) there are two candidates for the role of *z*, namely, *x* itself, and the main clause of the sentence *y*. We have to check whether *x* is semantically negative with respect to at least one of these two candidate clauses.

(i) If I strike this match, it will light =\=>

If I dip this match in water and strike it, it will light.

This issue is not relevant for my analysis, since the antecedent of a conditional is in any case a non-assertive environment.

First, let's take $z = x$. We now want to check whether x is assertive relative to x and whether x is downward monotone relative to x. However, the definitions of assertivity and downward monotonicity cannot be applied to x directly. The reason is that x is a relative clause, and it does not express a complete proposition, while the definitions of assertivity and downward monotonicity are formulated for clauses expressing propositions.

One way to deal with this problem is to find a proposition that would represent the clause for the purposes of testing the conditions. Giannakidou (1999:398) encountered the same problem in applying the condition of veridicality to relative clauses. Her solution was to represent the relative clause as a proposition with existential quantification replacing the relative pronoun. For example, the clause x is represented as *someone visited John*. I adopt Giannakidou's approach for such clauses.

Let us now examine the properties of x relative to x. First, x is assertive relative to x, since every clause is assertive relative to itself. However, x is not downward monotone relative to itself, since the predicate position of x (the position of the verb) is not downward monotone relative to x. This can be illustrated by the following entailment, which does not hold.

(695) Someone *met* John. =/>

(696) Someone *visited* John.

Since x is not downward monotone relative to itself, it is not semantically negative relative to itself.

Let's now take $z = y$, which is the entire sentence, and examine whether x is semantically negative relative to y. To examine for downward monotonicity, we check if the predicate position of x is downward monotone relative to y. This is indeed the case, as the following entailment demonstrates:

(697) Everyone who *met* John liked him. $\Rightarrow$

(698) Everyone who *visited* John liked him.

Therefore, the clause x is downward monotone relative to y.

However, the clause *x* is not assertive relative to *y*. Indeed, asserting (699) does not illocutionary entail asserting (700).

(699) $[_{y}$Everyone $[_{x}$who visited John$]_{x}$ liked him$]_{y}$.

(700) Someone visited John.

While (701) implies that there were people who visited John, this implication is not an assertion, and it can be canceled:

(701) Everyone who visited John liked him, since, in fact, no one visited him.

It is sometimes assumed that (699) presupposes (700). This is compatible with the conclusion that (699) does not illocutionary entail (700), since propositions presupposed by (699) are not asserted when (699) is asserted.

Since *x* is not assertive relative to *y*, *x* is not semantically negative relative to *y*. We have seen that *x* is also not semantically negative relative to *x*. Therefore, there is no clause *z* such that *x* is semantically negative relative to *z*, hence *x* is not semantically negative. The licensing condition of semantic negativity does not hold, so negative polarity particles are predicted not to occur in the restrictor clause of a universal, such as clause *x*. This prediction turns out to be correct.

Other examples of NPI-licensing environments that are predicted not to license NPPs are: superlative clauses, comparative clauses, and factive emotive adversatives. The NPIs are licensed in the restrictor clause used with superlative, as in the following example:

(702) This is the best movie I have *ever* seen.

I demonstrate how the condition of semantic negativity applies to such clauses using the following example:

(703) $[_{y}$ John is the most interesting person $[_{x}$I have ever met$]_{x}$ $]_{y}$.

A clause *x* is semantically negative iff there exists a clause *z* such that *x* is semantically negative relative to *z*. In (703) there are two candidates for the role of *z*, namely, *x* itself, and the main clause of the sentence *y*. We have to check whether *x* is semantically negative with respect to at least one of these two candidate clauses.

First, let's take z = x, examining *x* relative to itself. As in (694), the clause *x* is a relative clause, and does not represent a complete proposition, since the object position is set by the quantification in the parent clause. In order to examine the assertivity and downward monotonicity of the clause *x*, the object position is replaced by an existential, as follows:

(704) I have met *someone*.

The clause *x* is an ordinary positive clause, hence it is assertive relative to itself. However, it is not downward monotone relative to itself, since the following entailment does not hold:

(705) I have *met* someone. =/>

(706) I have *visited* someone.

Since *x* is not downward monotone relative to itself, it is not semantically negative relative to itself.

Now we take *z = y*, examining *x* relative to *y*. We check whether *x* is downward monotone relative to *y*, that is, whether the predicate position of *x* is downward monotone relative to *y*, by examining the following entailment:

(707) John is the most interesting person I have ever *met*. =>

(708) John is the most interesting person I have ever *visited*.

According to Herdan and Sharvit (2006:5), the restrictor clause of the superlative construction is presupposed. The contrast in (709) is used to support this analysis. This test is based on the assumption that one can doubt that *p* only if one believes the presuppositions of *p*. Continuation *b* in which the negation of the restrictor clause is ascribed to John's thoughts is not felicitous, supporting the point of view that the restrictor is presupposed.

(709) John doubts that Emma is the tallest student in this class.

a. He thinks it is likely that Sally is taller.

b. #He thinks it is likely that Emma is not a student in this class at all.

Adopting this analysis, we assume that (707) presupposes *John is a person I have met* and (708) presupposes *John is a person I have visited*. Since the set of people I have met is a superset of the people I have visited, (707) and the presupposition of (708) entail (708), and the entailment holds. The reason is that if *x* has the largest measure on some scale in *P*, it also has the largest measure in *P'* $\subseteq$ *P*, given that *x* also belongs to P'. Since (707) Strawson-entails (708), *x* is downward monotone relative to *y*.

Now we check whether *x* is assertive relative to *y*. The clause *x* is assertive relative to *y* if *y* illocutionary entails *x*, that is, someone asserting *y* also asserts *x*. For the purposes of examining this entailment, the proposition of *x* is taken to be as in (704), *I have met someone*. According to the analysis presented above, (703) presupposes *John is a person I have met*. Since (704) is entailed by *John is a person I have met*, that is, (704) is entailed by the presupposition of *y*, (704) is not asserted when *y* is asserted. This means that *x* is not assertive relative to *y*.

Since *x* is not assertive relative to *y*, *x* is not semantically negative relative to *y*. We have seen that *x* is also not semantically negative relative to *x*. Therefore, there is no clause *z* such that *x* is semantically negative relative to *z*, hence *x* is not semantically negative. The licensing condition of semantic negativity does not hold, so negative polarity particles are predicted not to be licensed by the superlative restrictor clauses, such as clause *x*. This prediction turns out to be correct.

The next environment I examine is the comparative subordinate clause, using the following example:

(710) $[_y$ It is easier/harder to contact Bill by email than $[_x$ to meet him$]_x$ $]_y$.

First I examine the semantic negativity of *x* relative to *x* itself and then relative to *y*. In example (710) we encounter the same problem as with (673) and (694) above, namely, that the clause *x* does not express a standalone proposition, and the definitions of clausal assertivity and downward monotonicity cannot be applied to it directly. I use the same solution proposed above: for the purposes of examining assertivity and downward monotonicity the clause *x* will be represented by the following proposition:

(711) Someone met Bill.

This is a simple affirmative clause, so *x* is assertive relative to itself, but not downward monotone relative to itself. Therefore, *x* is not semantically negative relative to itself.

We can now examine the semantic negativity of *x* relative to *y*. Let us examine the downward monotonicity first. It turns out that the downward monotonicity depends on the choice of the adjective in the main clause. With the adjective *easier*, the clause *x* is downward monotone relative to *y*, as the following entailment demonstrates:

(712) It is easier to contact Bill by email than to *meet* him. =>

(713) It is easier to contact Bill by email that to *visit* him.

On the other hand, with the adjective *harder*, the clause *x* is not downward monotone relative to *y*, since the following entailment does not hold:

(714) It is harder to contact Bill by email than to *meet* him. =/>

(715) It is harder to contact Bill by email that to *visit* him.

However, the antecedent clause *x* is not assertive relative to *y*, regardless of the choice of the adjective. A clause *x* is assertive relative to *y* iff $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(x)$ or $\text{ASSERT}(y) \Rightarrow_{\text{ILL}} \text{ASSERT}^{i}(\neg x)$, for some assertion strength *i*. In our case, we have to examine whether the sentence (710) illocutionary entails (711) or its negation. This is not the case; (710) does not assert *Someone met Bill*, nor does it assert *No one met Bill*. Therefore, *x* is not assertive relative to *y*, hence *x* is not semantically negative relative to *y*.

Since *x* is not assertive relative to *y*, *x* is not semantically negative relative to *y*. We have seen that *x* is also not semantically negative relative to *x*. Therefore, there is no clause *z* such that *x* is semantically negative relative to *z*, hence *x* is not semantically negative. The licensing condition of semantic negativity does not hold, so negative polarity particles are predicted not to occur in the complement of an emotive factive, such as clause *x*. This prediction turns out to be correct.

Another NPI-licensing environment in this category is the complement of emotive factives. Consider the following sentence

(716) $[_y$ I'm sorry $[_x$ you visited John $]_x]_y$.

Let us examine whether the clause *x* is semantically negative. A clause *x* is semantically negative iff there exists a clause *z* such that *x* is semantically negative relative to *z*. In (716) there are two candidates for the role of *z*, namely, *x* itself, and the main clause of the sentence *y*. We have to check whether *x* is semantically negative with respect to at least one of these two candidate clauses.

First, we take *z* = *x* and check whether *x* is semantically negative relative to itself. As demonstrated above, an ordinary affirmative clause is not semantically negative relative to itself. Such a clause is assertive relative to itself, but not downward monotone relative to itself.

Another candidate for the role of *z* is *y*, the entire sentence. A clause *x* is semantically negative relative to *y* if *x* is assertive relative to *y* and downward monotone relative to *y*. According to the analysis of Kadmon and Landman (1993) presented in section 2.3.2, the emotive factives create a downward monotone environment. In our case, *x* is downward monotone relative to *y* if its predicate position is downward monotone relative to *y*. The predicate position is the position of the verb, so *x* is downward monotone relative to *y* if entailments like the following hold:

(717) I'm sorry that Bill *met* John. =>

(718) I'm sorry that Bill *visited* John.

The downward monotonicity is examined given that the presuppositions of the conclusion (718) are satisfied. The verb *sorry* is factive, so (717) presupposes *Bill met John*, while (718) presupposes *Bill visited John*. According to Kadmon and Landman's (1993) analysis of *sorry*, the assertion of (717) is true iff in the preferred worlds of the speaker it is not true that Bill met John, that is, Bill did not meet John. If in all the preferred worlds Bill did not meet John, it is also true that in all the preferred worlds Bill did not visit John. Therefore, the assertion of (718) is true as well. This shows that (717) together with the presupposition of (718) entail (718), so the

predicate position of *x* is indeed downward monotone relative to *y*, and the clause *x* is downward monotone relative to *y*.

However, *x* is not assertive relative to *y*. Indeed, (719) does not assert (720), but rather presupposes (720), due to the factivity of the predicate *sorry*.

(719) I'm sorry that Bill met John.

(720) Bill met John.

Since *x* is not assertive relative to *y*, *x* is not semantically negative relative to *y*. We have seen that *x* is also not semantically negative relative to *x*. Therefore, there is no clause *z* such that *x* is semantically negative relative to *z*, hence *x* is not semantically negative. The licensing condition of semantic negativity does not hold, so negative polarity particles are predicted not to occur in the complement of an emotive factive, such as clause *x*. This prediction turns out to be correct.

This prediction is confirmed for almost all the categories mentioned above. The superlative construction is an exception, allowing the NPP *yet*. It does not license *either* or *neither*.

(721) *If you work there *anymore*, leave.

(722) *I feel better than I have ever felt before *either*.

(723) *I regret that I'm in Spain *anymore*.

(724) No one of us has ever been to Amsterdam. *Everyone/*No one who has been to Brussels *either* wants to go there again some day.

(725) It is by far the best book I have *yet* purchased in the field of Web Design.

In environments discussed in this section the behavior of NPPs differs from NPIs like *any* and *ever*. These environments are known to be NPI-licensing, but the NPPs are not licensed in them. Although they are downward monotone, they are not assertive, and hence not semantically negative.

8.5 Locality

One important feature of the semantic negativity condition as defined above is its locality. If a clause *x* is semantically negative in *x′*, further embeddings of *x′* will not alter the semantic negativity of *x*. The reason is that *x* will remain semantically negative relative to *x′*. Let's examine such an example:

(726) $[_x$ He won't come$]_x$.

(727) $[_y$If $[_x$he doesn't come$]_x$, I won't play the guitar$]_y$.

A simple sentence with sentential negation (726) is semantically negative. The clause *x* is assertive relative to *x*, since assertivity is reflecive. The clause *x* is also downward monotone relative to *x*, since its predicate position is downward monotone relative to *x*. This can be demonstrated by the validity of the following entailment, in which the denotation of the verb in the subordinate clause in the premise, *move*, is a superset of the denotation of the verb in the conclusion, *jump*:

(728) He won't *move*. ⇒

(729) He won't *jump*.

Since *x* is assertive relative to *x* and downward monotone relative to *x*, *x* is semantically negative relative to *x*, hence it is semantically negative.

What if we embed *x* in a non-assertive environment, such as the antecedent of a conditional (727)? If we examine the semantic negativity of *x* relative to the entire sentence *y*, we will reach the conclusion that *x* is not semantically negative relative to *y*. It has been shown in the analysis of (691) above that the antecedent of a conditional is not semantically negative relative to the conditional sentence, since the antecedent is not assertive relative to the conditional sentence. However, we can still examine the semantic negativity of *x* relative to itself. This analysis works exactly as shown above for sentence (726): a clause is assertive relative to itself, and the predicate position of *x* is downward monotone relative to *x*, so *x* is semantically negative relative to *x*.

Due to this feature of semantic negativity the proposed licensing condition predicts that the NPP licensing properties of a semantically negative clause are not affected by embedding. This prediction is correct, as demonstrated by the following examples:

(730) John won't come. Bill won't come *either*.

(731) John won't come. If Bill doesn't come *either*, I won't play the guitar.

8.6 Evaluation

We have seen that in almost all the examined cases, the semantic negativity condition correctly predicts whether the NPPs can or cannot be used in most of the environments discussed. When an NPI licensor creates a DM environment in the same clause or in an assertive subordinate clause, the environment is semantically negative. The licensing condition predicts that the NPPs are licensed, and this is indeed the case. When a DM environment is created in a non-assertive subordinate clause, the environment is not semantically negative. The licensing condition predicts that the NPPs are not licensed, and the NPPs are indeed not licensed in such environments.

One exception is the second argument of *only*: this environment is semantically negative, and the NPPs are predicted to be licensed. Nevertheless, the NPPs can occur in this environment in very limited cases. Superlatives constitute another exception. Being non-assertive, this environment is not semantically negative, and the NPPs are predicted not to occur. Nevertheless, the NPPs *anymore* and *yet* can occur in superlatives. On the other hand, the NPPs *either* and *neither* behave according to the prediction and do not occur in this environment.

The condition of semantic negativity describes the behavior of the NPPs better than the earlier proposals. The distribution of the NPPs in the different environment and the predictions of the earlier proposals and of the semantic negativity condition are summarized in the following table:

	NPPs occur	downward monotonicity (Ladusaw 1980a)	antiadditivity (Szabolcsi 2004)	DM and NV (Nathan 1999)	negative implication (Rullmann 2003)	semantic negativity
Negation	yes	yes	yes	yes	yes	yes
few, rarely	yes	yes	no	no	no	yes
negative implicative verbs	yes	yes	yes	yes	yes	yes
negative implicative constructions	yes	yes	yes	yes	yes	yes
doubt	yes	yes	yes	yes	no	yes
antecedents of conditionals	no	yes	yes	yes	no	no
restrictors of positive quantifiers	no	yes	yes	no	no	no
restrictors of *no*	no	yes	yes	yes	yes	no
comparatives	no	yes	yes	yes	no	no
emotive factives	no	yes	yes	no	no	no

Table 12. Earlier proposals and semantic negativity

Compared to the previous condition of negative implication proposed for *either* by Rullmann (2003), the condition of semantic negativity improves the predictions for three kinds of environments. For sentences with *few* and *rarely* and for the complements of *doubt*, the prediction of the earlier condition was that the NPPs are

not licensed, contrary to fact, and the prediction of semantic negativity is that the NPPs are licensed, as is the case. For the restrictor of *no*, the prediction of the earlier condition is that the NPPs are licensed, contrary to fact, and the prediction of semantic negativity is that the NPPs are not licensed, as is the case. This shows that the empirical adequacy of the condition of semantic negativity is more than that of the earlier proposals.

8.7 Validating the theory: *almost* and *barely*

The condition of semantic negativity was formulated based on observing the behavior of the NPPs in a number of environments. In this section I test this condition on a pair of environments that were not used during the formulation of the condition, namely, sentences with *almost* and *barely*. The words *almost* and *barely* exhibit an important contrast in their NPI-licensing behavior, and the importance is due to their seemingly unexpected behavior. This feature makes this pair of verbs a good test case for theories of NPI licensing.

According to the most common analysis (Horn 2002), both *almost* and *barely* have two meaning components: the polar component and the proximal component. The phrase "*almost X*" has the polar component "*not X*" and the proximal component "X is/was close". The expression "*barely X*" has the polar component "X" and the proximal component "*not X* is/was close".

For example:

(732) My printer is <u>almost</u> functional.

polar component: My printer is not functional

proximal component: My printer is close to being functional.

(733) My printer is <u>barely</u> functional.

polar component: My printer is functional.

proximal: My printer is close to being not functional.

It can be seen that *almost* has a negative polar component and a positive proximal component. The word *barely* is the opposite: it has a positive polar component and a negative proximal component. Which component influences the NPI licensing? It

turns out that it is the proximal component that influences the licensing and not the polar one. While *barely* licenses NPIs (735), *almost* does not (734). This is despite the fact that *almost X* entails *not X*, while *barely X* entails *X*. That is, the licensing is the opposite of what can be expected if it were determined by the polar component.

(734) *She almost *slept a wink*/spoke to *anyone*.

(735) She barely *slept a wink*/spoke to *anyone*.

A possible explanation of the fact that it is the proximal component that determines the NPI licensing can be made if we observe the asymmetric status of the two components with respect to the assertion. A number of tests have been used to show that while the proximal component is asserted, the polar component is not asserted, but rather presupposed or "backgrounded" (Horn 2002; Amaral 2006).

For example, a yes/no question is interpreted as inquiring about the proximal component rather than about the polar component. That's why, (737) is a plausible elaboration of B's response to (736), but (738) seems less felicitous.

(736) A: Did John almost miss the train?

(737) B: Yes, he caught it just in the nick of time.

(738) B: #Yes, he managed to catch it.

Similarly, a negative answer to (736) is interpreted as negating the proximal component and not the polar component:

(739) B: No (= he didn't get close to missing the train; ≠ he missed the train).

Likewise, a *because* clause in a sentence like (740) refers to the proximal component and not to the polar component. The *because* clause in (740) provides the reason for the speaker's being close to canceling, not for the speaker's eventually not canceling. Trying to use the *because* clause to provide a reason for the polar component results in infelicity (741). The same explanation accounts for the difference between (742) and (743).

(740) I almost canceled because I was ill.

(741) #I almost canceled because I would have felt too guilty.

(742) I barely finished the paper on time because I was tired.

(743) #I barely finished the paper on time because it was easy.

Similarly, evaluative adverbs express an evaluation of the proximal component, not of the polar component:

(744) Fortunately, Peter can barely read. (so he couldn't fully understand the insults addressed to him / #so I can write him a note).

The contrast between (745) and (746) also supports the analysis above. The sentence with *almost* (745) has a positive proximal component and a negative polar component, and it is used to convey good news. Similarly, a sentence with *barely* (746) is used to convey bad news. This is consistent with the view that it is the proximal component that is asserted, and not the polar one.

(745) Good news: my printer is almost functional.

(746) Bad news: my printer is barely functional.

It is the asserted content that determines the NPI licensing and not the presupposed content. In sentences with *almost* the asserted proximal component is positive and does not create a downward monotone environment, hence the NPIs are not licensed. The asserted proximal component of sentences with *barely* is negative, creating a downward monotone environment, hence the NPIs are licensed.

The NPPs behave similar to the other NPIs: they are licensed by *barely* and not licensed by *almost*:

(747) We have barely/*almost started *yet*.

(748) I could barely detect the fragrance. […] They could barely/*almost smell it *either*.

(749) She barely acknowledged Ruthie, and *neither* did anyone else, understandably.

(750) It's barely/*almost recognizable *anymore*.

(751) They barely/*frequently talk *anymore*.

In order to see the predictions of the licensing condition of semantic negativity, let's examine which of the environments is semantically negative. Sentences with *almost* and *barely* are assertive relative to themselves, since assertivity is reflexive. The next thing to determine is downward monotonicity. Consider a pair of sentences with *barely*:

(752) Mary barely studied linguistics.

(753) Mary barely studied syntax.

Studied syntax entails *studied linguistics*. Does (752) entail (753)? We check the entailment under the condition that the presuppositions of both sentences are satisfied. The presupposition of (752) is that Mary studied linguistics, and the presupposition of (753) is that Mary studied syntax. The assertion of (752) is that Mary was close to not studying linguistics and the assertion of (753) is that Mary was close to not studying syntax. Given the presuppositions, *not studying linguistics* entails *not studying syntax*, and *close to not studying linguistics* entails *close to not studying syntax*, so (752) entails (753). This shows that the environment created by *barely* is downward monotone. Therefore, the NPI-licensor *barely* belongs to the first category of licensors discussed above: it creates a downward monotone environment in the same clause in which it appears. This makes the clause semantically negative, and according to the proposed licensing condition the NPPs are predicted to be licensed. This prediction is borne out, since, as shown above, the NPPs are indeed licensed by *barely*.

Consider now a pair of sentences with *almost*:

(754) Mary almost studied linguistics.

(755) Mary almost studied syntax.

Again, *studied syntax* entails *studied linguistics*. Does (754) entail (755)? The entailment has to be examined with the presuppositions of both sentences satisfied. The former presupposes that Mary didn't study linguistics, and the latter presupposes that Mary didn't study syntax. The assertion of (754) is that Mary was close to studying linguistics and the assertion of (755) is that Mary was close to studying syntax. Being close to studying linguistics does not entail being close to studying

syntax, as maybe she intended to study some other subfield of linguistics. Therefore, the environment created by *almost* is not downward monotone. In fact, it is upward monotone, as being close to studying syntax entails being close to studying linguistics, if the presuppositions mentioned above are satisfied. Since the clause with *almost* is not downward monotone, it is not semantically negative, and the NPPs are not predicted to be licensed. This prediction is borne out since, as shown above, the NPPs are indeed not licensed by *almost*.

The licensing of the NPPs with *barely*, but not with *almost*, is a problem for Rullmann's (2003) analysis. *Almost* X entails that X is false, while *barely* X entails that X is true. Therefore, the prediction of Rullmann's analysis is that *almost* will license the NPPs, and *barely* will not. As shown above, this prediction is the opposite of the observed facts.

The condition of nonveridicality proposed by Giannakidou (1999) for the regular NPIs and by Nathan (1999) for NPPs also has the same predictions. *Almost* X entails that X is false, so the environment it creates is nonveridical, and the NPPs are predicted to be licensed. *Barely* X entails X, so this environment is veridical, and the NPPs are predicted not to be licensed. Just as with Rullmann's condition, these predictions are the opposite of the observed facts.

Amaral and Schwenter (2007) observed that the word *hardly*, usually assumed to be similar to *barely*, in fact has two usages. Indeed, in some cases it behaves similarly to *barely*, as in (756). This is the regular meaning of *hardly*. However, it can also be used to imply negation, in which case it cannot be replaced by *barely*, as in (757). This is called "the inverted reading".

(756) Bush hardly/barely won.

(757) Online authors hardly/#barely need to be famous.

In general, the NPI-licensing behavior of *hardly* in the regular meaning is similar to that of *barely*, while the behavior of *hardly* in the inverted meaning is similar to that of negation. Since both *barely* and negation license negative polarity particle, *hardly* licenses NPPs in both its readings:

(758) I can hardly believe it *either*.

(759) It hardly mattered *anymore*.

8.8 Problems for the condition of semantic negativity

8.8.1 Quantifiers

The first phenomenon that is problematic for the condition of semantic negativity is the NPP-licensing properties of the quantifiers *nobody but X* and *only X*, as in the following sentences:

(760) Nobody but John likes tomatoes.

(761) $[_x$Only John likes tomatoes$]_x$.

Let us examine the semantic negativity of the clause *x* in (761). Since this sentence contains only one clause, we check the semantic negativity of *x* relative to *x* itself. We have seen in section 8.2 above that the notion of assertivity is reflexive, so *x* is assertive relative to *x* itself. We must now check whether *x* is also downward monotone relative to itself.

A clause *x* is downward monotone relative to *x* if its predicate position is downward monotone relative to *x*. In this case the predicate position is the position of the verb *likes*. To examine the downward monotonicity of (761), we examine the entailment between (762) and (763). In (763), the verb *like* is replaced with its hyponym *adore*.

(762) Only John *likes* tomatoes. =>

(763) Only John *adores* tomatoes.

The notion of downward monotonicity I use is Strawson-DM, in which the entailment is checked given that the presupposition of the conclusion is satisfied. According to the analysis of *only* discussed in section 2.3.2 above, the meaning of (762) combines two propositions of different status:

(764) Exclusive: No one who is not John likes tomatoes.

Prejacent: John likes tomatoes.

The exclusive proposition is undoubtedly asserted. The prejacent composition is claimed to be presupposed (Horn 1969) or otherwise not asserted (Horn 2002). Adopting the analysis of Ladusaw (1980a) and von Fintel (1999), I assume that the prejacent is presupposed. This means that (762) has the presupposition *John likes tomatoes* and (763) has the presupposition *John adores tomatoes*. Given (762), *Only John likes tomatoes*, and the presupposition of (763), *John adores tomatoes*, we can definitely conclude that (763) holds. Therefore, the entailment from (762) to (763) is Strawson-valid, and the clause *x* in (761) is downward monotone relative to itself.

Since *x* is downward monotone relative to itself and assertive relative to itself, *x* is semantically negative relative to itself. Therefore, *x* is semantically negative, and according to the licensing condition the negative polarity particles are licensed in this clause. If we assume with von Fintel (1999) that the clauses (760) and (761) have the same semantic content, it is also predicted that the NPPs will be licensed in the clause with *nobody but*.

The NPP-licensing behavior of *nobody but* is according to predictions, as negative polarity particles are licensed by this expression. However, *only* fails to license the NPPs, contrary to expectations (Nathan 1999; Gajewski 2005, 2008):

(765) [John is the one person I know who likes broccoli.]

a. Nobody but John likes [tomatoes]$_F$, *either*.

b. *Only John likes [tomatoes]$_F$, *either*.

(766) a. Nobody but John has arrived *yet*.

b. *Only John has arrived *yet*.

(767) a. Nobody but you watches this show *anymore*.

b. *Only you watch this show *anymore*.

(768) a. Mary likes nobody but John, and *neither* does Sue.

b. *Mary likes only John, and *neither* does Sue.

The condition of semantic negativity fails to distinguish between *nobody but X* that licenses the NPPs and *only X* that does not. The same is true for all the previous

proposals for the negative polarity particles. Rullmann's conjecture is that the overt negativity in *nobody but* somehow influences the licensing properties. Finding the reasons for the difference between the two expressions is left for further research.

There are other kinds of semantically equivalent quantifiers that exhibit different NPP-licensing behavior. For example, the quantifiers *no more than X* and *at most X* are equivalent. They are downward monotone on the second argument, and according to the licensing condition of semantic negativity both are predicted to license negative polarity particles. As demonstrated by (769), while the NPP *either* is licensed in a sentence with *no more than* 25%, it is not licensed by a sentence with *at most 25%*. The quantifier *less than 25%* is also problematic. While its second argument position is downward monotone, and the clause in which it appears is semantically negative, the negative polarity particles are not licensed.

(769) [Of all the students on this campus, perhaps a quarter, if that many, like broccoli.]

a. No more than 25% like [tomatoes]$_F$, either.

b. *At most 25% like [tomatoes]$_F$, either.

c. *Less than 25% like tomatoes, either.

8.8.2 Questions

As mentioned above, the negative polarity items are licensed by questions:

(770) Have we reached the bottom *yet*?

(771) Do you smoke *anymore*?

(772) While we cannot afford to have any more underground raves, how can we afford to have the above ground ones *either*?

The clauses in the question sentence express a question, and not an assertion, so these environments are not assertive. Therefore, they are not semantically negative, and according to the condition of semantic negativity the negative polarity particles are not expected not be licensed. This prediction turns out to be incorrect.

Rullmann (2003) claims that when the interrogative sentences license the negative polarity particles, the expected answer is no, and this is taken to be the implication of the sentence. For example, Rullmann sees (772) as having the implication *we cannot afford the above ground ones*. This implication is negative, and it satisfies Rullmann's licensing condition. If we see this implication as being asserted, which makes more sense in the case of rhetoric questions, such an environment becomes negative implicative, and then it is expected to license negative polarity particles.

However, in other cases of negative polarity particles in questions such as (770) and (771) there is no negative implication, but only negative bias. The more expected answer is negative, but the positive answer is also possible. Therefore the negative answer is not an implication and neither Rullmann's condition nor semantic negativity can explain the fact that the negative polarity particles are licensed.

9 Argumentative orientation and the meaning of NPPs

9.1 Positive/negative argumentative orientation

Let's assume that we are about to go for a walk today. Rain is possible, and we don't want to get wet. In this case, it is possible to say the following:

(773) It will rain today. Let's take an umbrella.

In this sequence, a sentence *p = It will rain today* provides support for the suggestion *q = Let's take an umbrella*. On the other hand, the negation of *p* does not provide support for the conclusion *q*. This explains why the following sequence is infelicitous:

(774) It will not rain today. #Let's take an umbrella.

Instead, ¬p provides support for ¬q, as the following sequence demonstrates:

(775) It will not rain today. Let's not take an umbrella.

What if we embed the sentence *p* in a larger sentence F(p)? Will F(p) provide support for the conclusion *q*, as does *p* itself? Or, maybe, it will support the conclusion ¬q? Of course, this depends on the nature of the embedding. The following examples show conclusions supported by *p*, ¬*p*, and a number of other modifications:

(776) It will rain. Let's take an umbrella. #Let's not take an umbrella.

(777) It will not rain. #Let's take an umbrella. Let's not take an umbrella.

(778) I doubt it will rain. #Let's take an umbrella. Let's not take an umbrella.

(779) Maybe it will rain. Let's take an umbrella. #Let's not take an umbrella.

(780) It rarely rains. #Let's take an umbrella. Let's not take an umbrella.

At this point I would like to give a preliminary definition of what I mean by positive or negative argumentative orientation. A sentence F(p) has a positive argumentative orientation if it provides support or evidence for conclusions as does *p*, and it has a negative argumentative orientation if it provides support or evidence for conclusions as does ¬p. It is best to check the argumentative orientation with respect

to the same possible conclusion. Let's say we have two sentences, *p* and *q*, so that given *p* provides support for the conclusion *q*, and given ¬p supports the conclusion ¬q. Then if F(p) provides support for q, the argumentative orientation of F(p) is positive, and if F(p) provides support for ¬q, then the argumentative orientation of F(p) is negative. In (776) - (780) above q = *Let's take an umbrella*, and the felicitousness judgments show that the sentences in (778) and (780) have a negative argumentative orientation, while (779) has a positive argumentative orientation.

This strategy is used by Horn (2006) in the following examples to examine the effects on argumentative orientation of the words *almost* and *barely*:

(781) The tank is full, let's drive on / #let's stop to fill it.

(782) The tank is almost half full, let's drive on / #let's stop to fill it.

(783) The tank is barely half full, #let's drive on / let's stop to fill it.

The sentence with *almost* (782) supports same conclusion as the positive sentence, so its argumentative orientation is positive. The sentence with *barely* (783) supports the opposite conclusion, so its argumentative orientation is negative.

9.2 Topoi

The discussion above suggests that the only thing determining the argumentative impact of a sentence is its surface form. Thus, it may seem that *almost p* always supports the same conclusion as *p*, and *barely p* always supports the opposite conclusion. However, this is not always true, as shown by the following counterexample:

(784) We haven't arrived at the hotel yet. Let's continue driving there.

(785) We have almost arrived at the hotel. Let's continue driving there.

(786) We have arrived at the hotel. #Let's continue driving there.

In this case a sentence with *almost* (785) supports the same conclusion as a negative sentence (784). This conclusion is not supported by the positive sentence (786).

We need some method in order to explain in which cases the argumentative orientation of F(p) can be predicted based only on the nature of the embedding. We would like to distinguish between cases like (781) - (783), in which a sentence of the form *almost p* supports a conclusion just like the positive *p*, and (784) - (786), in which it does not. To achieve this goal, Anscombre and Ducrot introduce the notion of *topos* (Anscombre 1995; Ducrot 1995; Nyan 1998:52-59; Iten 2000).

A topos is an argumentative rule of the following type, scalar in nature:

(787) <The more/less object O possesses property P, the more/less object O' possesses property P>.

There are four possible topos forms:

(788) a. <+A,+B>

b. <-A,-B>

c. <+A, -B>

d. <-A, +B>

The following sentences demonstrate the four possible topos forms. Proposition A is 'the weather is warm' and B is 'the beach is pleasant',

(789) a. (The warmer the weather)$_{+A}$, (the more pleasant the beach)$_{+B}$.

b. (The colder the weather) $_{-A}$, (the less pleasant the beach) $_{-B}$.

c. (The warmer the weather) $_{+A}$, (the less pleasant the beach) $_{-B}$.

d. (The colder the weather) $_{-A}$, (the more pleasant the beach) $_{+B}$.

In the examples above, (a) and (b) are expressions of the same underlying topos, while (c) and (d) are expressions of another underlying topos. These topoi are incompatible. Let's call the former T1 and the latter T2.

Different topoi can allow different transitions from premisses to conclusion. For example, if one wants to go to the beach if and only if the beach is pleasant, T1 can support the sequences (790) and (791), while T2 can support the sequences (792) and (793):

(790) It’s warm. Let’s go to the beach.

(791) It’s not warm. Let’s not go to the beach.

(792) It’s warm. Let’s not go to the beach.

(793) It’s not warm. Let’s go to the beach.

We can now see when the argumentative orientation can be predicted based on the surface form. This happens when the argumentation follows an appropriate topos. Consider, for example, the sentences (776) - (780) above. They refer to the following topos connecting the chance of rain and taking an umbrella.:

(794) <The greater the chance of rain, the more reason to take an umbrella.>

A positive claim on the first scale leads to a positive claim on the second scale. That’s why a positive claim, even qualified by *maybe*, on the first scale supports the positive conclusion, while an assertion with *rarely* or *doubt* supports a negative conclusion.

The argumentation in sentences (781) – (783) refers to the topos:

(795) <The fuller the tank, the less need to stop to fill it>

Positive claims on the first scale, such as (781) and (782), are compatible with the conclusion that there’s no need to stop and therefore that it’s preferable to drive on. A negative claim on the first scale, as in (783), is compatible with a negative conclusion on the second scale, leading to the suggestion to stop to fill the tank.

What about the sentences (784) - (786)? There is no topos of the form described above that can explain the argumentation. The underlying argumentation is of the form “if we haven’t arrived at the hotel, we need to continue driving”, which cannot be reduced to the format of the topos presented above. If we tried to formulate the topos according to the conclusions drawn from the positive and the negative sentence, it would be something like the following <the less we have arrived, the more the need to continue driving>. However, this form of argumentation is not supported by reality, since the need to continue driving does not diminish until the arrival to the final

destination. Therefore, the conclusion from intermediate levels of arrival as in (785) is not as predicted.

Using the notion of topoi we can refine the definition of *argumentative orientation*. Let's assume there is a topos T = <+P, +Q>. If a clause *p* refers to the first sentence P of the topos T and supports a conclusion suggesting a high value of Q, the clause has a *positive argumentative orientation*. For our needs, I will sometimes compare a simple positive *p* known to lead to a positive conclusion *q* to F(p) whose argumentative orientation we are interested in finding out. On the other hand, if a clause *p* refers to the topos T and supports a conclusion suggesting a low value of Q, the clause has a *negative argumentative orientation.*

According to this definition, we can establish that (779) and (782) have a positive argumentative orientation, since they support a positive conclusion using a topos, just like the corresponding simple positive sentences. On the other hand, we do not say that (785) has a negative argumentative orientation. Although (785) supports the same negative conclusion as the negative sentence (784), this is done without referring to a topos of the appropriate form, so the definition of negative argumentative orientation does not apply.

9.3 Testing for argumentative orientation

9.3.1 Discourse connectives

The argumentative orientation does not have to be evaluated directly by looking at the inferences. In this section I describe a number of other ways to determine the argumentative orientation given in the literature. One way to do this is to examine the usage of sentences with discourse connectives such as *but* and *so*. The work on argumentative scales (Ducrot 1973; Anscombre and Ducrot 1977) uses both direct inferences and the discourse connectives.

Winter and Rimon (1994) propose the following condition for "p, but q": p implies some ¬r; q implies r, and cancels p's implication. Sentences with the discourse connector *but* can be used to test for argumentative orientation in the following way. The test begins with a pragmatically acceptable sentence "p, but q". If p can be replaced by F(p), then F(p) has a positive argumentative orientation, and the same

holds for q. If F(p) can replace ¬p in a felicitous “p, but q”, then F(p) has a negative argumentative orientation. Sentences of the kind “p, so q” can be used in a similar fashion.

This approach is exemplified in the sentences below, using the second conjunct for the testing. A positive second conjunct q of (796) is replaced by *maybe* q in (797), and the sentence remains reasonable. This shows that *maybe* q has a positive argumentative orientation.

(796) The forecast said rain, so they took an umbrella.

(797) The forecast said rain, so maybe/probably they took an umbrella.

In the following two sentences a negative conjunct ¬q of (798) is replaced by *I doubt that* q in (799), and the argumentation remains valid. This shows that *I doubt that* q has a negative argumentative orientation.

(798) The forecast said rain, but they didn’t take an umbrella.

(799) The forecast said rain, but I doubt they took an umbrella.

Both pairs of sentences make use of the following topos:

(800) <The more rain predicted, the more reason to take an umbrella>

9.3.2 Psycholinguistic research

A number of studies (Jarvella and Lundquist 1994; Lundquist and Jarvella 1994) investigate the impact of the argumentative orientation of a sentence on interpretation of other sentences. Lundquist and Jarvella (1994) examine the effect of scalar expressions on disambiguation of referential expressions. The first sentence contains a proper name and a scalar expression. A second sentence contains a definite noun phrase which could be interpreted to the same individual as the proper name, or to a different individual. An example of such a pair of sentences:

(801) *Nichols* obtained 129 points. *The red-haired Irish* lad seemed to be leading.

In (801), the definite noun phrase in the second sentence can refer either to Nichols or to another person. However, introducing a scalar adverb in the numerical phrase in the first sentence has the effect of disambiguating the noun phrase:

(802) Nichols obtained *almost* 129 points. The red-haired Irish lad seemed to be leading.

(803) Nichols obtained *only* 129 points. The red-haired Irish lad seemed to be leading.

In (802), the definite noun phrase in the second sentence is interpreted as referring to Nichols. On the other hand, in (803) it is interpreted as referring to another competitor. Lundquist and Jarvella (1994) performed experiments in which sentences similar to (802) and (803) were shown to subjects and the subjects were asked to say whether the noun phrase in the second sentence refers to the same person as the proper name in the first sentence or to some other person. The answers of the vast majority of the speakers were according to the judgments above.

The explanation of these facts given by Lundquist and Jarvella (1994) makes use of the notion of topos described in section 9.2. The argumentation in the sentences above refers to the following 'competition topoi':

(804) Competition topos C: <the more points that X gets, the more likely it is that X will be winning>

(805) Competition topos C': <the fewer points that X gets, the more likely it is that someone else is winning>

The first sentence in (802) makes a positive claim, fitting the first part of topos C. The second sentence is assumed to be a natural conclusion, and the second part of topos C is that Nichols is winning. The definite noun phrase in (802) is interpreted as referring to Nichols since this way the sentence fits the second part of topos C.

On the other hand, the first sentence in (803) makes a negative claim, fitting the first part of topos C'. The second sentence is assumed to be a conclusion, and the second part of topos C' is that someone other than Nichols is winning. The definite noun phrase in (803) is interpreted as someone other than Nichols since this way the second sentence fits the second part of topos C'.

A similar type of argument was discussed by Jarvella and Lundquist (1994):

(806) George Brown got almost/only 5,000 votes. He is likely to win/lose the election.

The first sentence with *almost* is naturally followed by a second sentence with *win*, and choosing *only* in the first sentences suggests choosing *lose* in the second one. The appropriate topos in this case is:

(807) <the more votes a politician gets, the more likely s/he is to win the election>

The experiments conducted by Jarvella and Lundquist (1994) in which the speakers were asked to choose the natural conclusion support the observations above.

9.3.3 Positive/negative attitude

Horn (2002:57) tests the argumentative orientation using the expressions "Good news" and "Bad news" to show that sentences with *almost* behave as positive sentences, and sentences with *barely* behave as negatives:

(808) Good news: My printer is functional.

(809) Good news: My printer is almost functional.

(810) Bad news: My printer is barely functional.

(811) Bad news: My printer is not functional.

Using evaluations of this type to test for argumentative can be justified since they can be seen as based on topoi of the following kind:

(812) <The more functional the printer is, the better.>

When a first part of the topos contains the original positive sentence, any assertion in the positive direction will result in good news, as in (808) and (809), and any assertion in the negative direction results in bad news, as in (810) and (811).

9.4 Argumentative orientation and the meaning of negative polarity particles

We have seen in section 3.5 above that the negative polarity particles stand out among the negative polarity items with respect to their role in the sentence. Negative polarity items typically express an extreme degree and affect the assertion of the

sentence. On the other hand, the negative polarity particles introduce a presupposition regarding a prior clause or event and do not influence the assertion of the sentence. The negative polarity particles also differ in their distribution and require a special licensing condition. In this section I explore the question of the connection between the meaning of the negative polarity particles and their distribution and suggest an answer.

First, I would like to explore the relation between the notions of argumentative orientation and semantic negativity. Examining the different sentences F(p) with negative argumentative orientation we notice that in all of them the clause related to *p* (the original positive sentence) is semantically negative. The following sentences were shown above to have a negative argumentative orientation:

(813) It will not rain.

(814) I doubt that *it will rain*.

(815) It rarely rains.

(816) The tank is barely half full.

All these sentences contain semantically negative clauses, with semantic negativity introduced by the underlined words.

What is the explanation for this observation? To answer this question, we should first find out what causes a sentence to have a negative argumentative orientation. My generalization regarding argumentative orientation is as follows: sentences with negative argumentative orientation express a *negative epistemic claim*, that is, a claim that the epistemic information regarding whether *p* holds or to what extend it holds is less than expected. For example, (813) negates the proposition, (814) explicitly expresses doubt towards the proposition, (815) says the predicate holds rarely, while (816) says that the extent of the predicate's realization is less than expected.

This generalization can help in explaining why the clauses with negative argumentative orientation are semantically negative. What causes a clause to have an epistemic claim is assertivity. If asserting the entire sentence also makes a clause embedded in that sentence asserted, the clause makes an epistemic claim regarding the

extent of its predicate's realization. If a clause is not asserted, such a claim is not made.

In a simple assertive clause the predicate position is upward monotone and the epistemic claim is positive. What makes the claim negative is downward monotonicity of the predicate position. An assertive clause whose predicate position is downward monotone is by definition semantically negative. Therefore, a negative epistemic claim arises in semantically negative clauses. Since negative argumentative orientation is caused by a negative epistemic claim, this explains why negative argumentative orientation only occurs in semantically negative clauses.

We can now approach the question of the meaning of the negative polarity particles. The proposals for the meaning of the negative polarity particles in the earlier literature assume that the NPPs only occur in syntactically negative clauses or clauses in negative implicative environments. Such is, for example, Löbner (1989)'s semantics for aspecual particles, discussed in section 3.5 above, and repeated here for convenience in Table 13.

Aspectual expression	Presupposition	Assertion	Additivity/contrast
already P	$\neg P(t_{ep})$	$P(t_a)$	contrast
yet P	$\neg P(t_{ep})$	$\neg P(t_a)$	additivity
still P	$P(t_{ep})$	$P(t_a)$	addivitity
anymore P	$P(t_{ep})$	$\neg P(t_a)$	contrast

Table 13. Presuppositions and assertions of expressions with aspectual particles

Similarly, Rullmann's (2003) formulation of the meaning of *either* includes a presupposition (817) and a condition on the host clause (818).

(817) Presupposition: [α *either*] presupposes that there is at least one contextually salient proposition $p \in [[\alpha]]^f - \{[[\alpha]]^o\}$ such that *p* is <u>false</u>.

(818) Assertion: [α *either*] must be contained in a constituent which implies (i.e. entails or implicates) that $[[\alpha]]^o$ is false. [(45.4) in (Rullmann 2003)]

The examination of the distribution of the NPPs made in chapter 4 shows that these formulations are inadequate. The NPPs occur in environments that are not negative implicative, contrary to these formulations. These proposals need to be amended to account for the actual distribution of the negative polarity particles.

My hypothesis is that the contribution of negative polarity particles is to *signal a negative argumentative orientation*. Specifically, the negative additive aspectual particle *yet* signals additivity between an earlier time period in which the situation was negative and a host clause with a negative argumentative orientation. The negative additive aspectual particle *either* denotes additivity between a negative antecedent clause and a host clause with a negative argumentative orientation. The negative contrastive particle *anymore* expresses contrast between an earlier time in which the predicate held and the host clause with a negative argumentative orientation. The amended Löbner's square is shown in Table 14.

Aspectual expression	Presupposition	Assertion	Additivity/contrast
already P	$\neg P(t_{ep})$	$P(t_a)$	contrast
yet P	$\neg P(t_{ep})$	signals a negative argumentative orientation in $P(t_a)$	additivity
still P	$P(t_{ep})$	$P(t_a)$	addivitity
anymore P	$P(t_{ep})$	signals a negative argumentative orientation in $P(t_a)$	contrast

Table 14. Presuppositions and assertions of expressions with aspectual particles [modified]

The following formulation can replace Rullmann's condition on the host clause as part of the description of the meaning of *either*.

(819) [α *either*] signals a negative argumentative orientation

The last question to be addressed in this section is that of the connection between the licensing condition of the negative polarity particles and their meaning. I proposed

that the negative polarity particles signal a negative argumentative orientation. As observed above, negative argumentative argumentation only arises in semantically negative clauses. Combining these two observations can help explain the licensing condition of semantic negativity: the negative polarity particles can only occur in semantically negative clauses since negative argumentative orientation can only be created in semantically negative clauses, and the negative polarity particles signal a negative argumentative orientation. That is, the licensing condition of semantic negativity (590) can be derived from the meaning of the negative polarity particles, and, as shown in section 8 above, semantic negativity is indeed a necessary licensing condition for the NPPs. Therefore, the notion of negative argumentative orientation can help explaining why semantic negativity is a necessary licensing condition for the negative polarity particles.

The exploration in this section has a preliminary character. To describe the connection between negative argumentative orientation and the NPPs and semantic negativity more formally, it is necessary to give a precise model-theoretic definition for the notions of topoi and argumentative orientation. This task is left for further research.

10 Further implications

10.1 Computational aspects

10.1.1 Sentiment classification

The notion of assertivity defined above can be helpful in some tasks in computational linguistics. In this section I discuss an example of such a task. In recent years a number of studies have addressed the task called *sentiment classification*, classifying texts like movie or travel reviews as positive or negative overall.

The basis of the methods employed for this task is the semantic orientation of adjectives and other words. The words *good* and *excellent* are examples of adjectives of positive orientation, and *bad* and *awful* are words of negative orientation.

Based on the works on argumentative orientation (Anscombre and Ducrot 1983), Hatzivassiloglou and McKeown (1997) introduced a method to acquire information about the semantic orientation of words using a small amount of tagged words and the Wall Street Journal corpus. First some adjectives are tagged as being positive or negative. The rest are classified accordingly using the information from co-occurrence of the adjectives with conjunctions; this information is combined using clustering techniques. When two adjectives occur together combined by the connective *and*, this fact is taken as evidence for the two adjectives being of the same orientation. The reason for this can be demonstrated by the difference between the pairs in which the adjectives are of the same orientation, such as *fair and legitimate* and *corrupt and brutal*, and those in which the adjectives are of different orientation, such as *#fair and brutal*, *#corrupt and legitimate*. The connective *but* behaves in the opposite way: it is used to combine adjectives of opposite semantic orientations. The difference between the connectives is demonstrated in (820) below. Hatzivassiloglou and McKeown (1997) report achieving a precision of more than 90% in predicting the semantic orientation of an adjective using this method.

(820) a. The tax proposal was simple and well-received by the public.

b. The tax proposal was simplistic but well-received by the public.

c. #The tax proposal was simplistic and well-received by the public.

Other studies, such as Turney (2002), employ a more statistical method, using the mutual information of a word *w* with the adjectives *excellent* and *poor* to make the decision on the semantic orientation of *w*.

Some studies use this information alone to make classifications (Turney 2002). Information on positive words and negative words occurring in the document is used to make a decision on the classification, ignoring the context in which these words appear. However, the context in which an adjective appears can clearly affect their contribution; 'good' and 'not very good' are expressions of opposite semantic orientation. Taking this fact into account, Das and Chen (2001) detect negation words such as *not*, *never* and *no* in a work on classifying stock reviews. Similarly, Pang et al. (2002) model the contextual effect of negation by adding the tag NOT_ to all the words between *not* (the only negation word they recognize) and the nearest punctuation mark.

Analyzing the methods for sentiment classification, Polanyi and Zaenen (2006) notice that recognizing only the most common words expressing overt negation, such as *not, never* and *no* is only a small step towards taking into account the effect of the context on the contribution of the adjective to the sentence. For example, there are words that modify the semantic orientation of the adjectives without containing overt negation. Polanyi and Zaenen (2006) discuss the different classes of expression changing the semantic orientation of a word and its strength. They call such expressions *valence shifters* ('valence' is another term for 'semantic orientation'). Among the classes of valence shifters they identify are: negatives, intensifiers such as *deeply* and *barely*, and modals such as *might* and *could*. Some valence shifters are discourse based. Examples are irony, that can reverse the semantic orientation, the connector *but* whose second argument overrides the impact of the first one, and reported speech, which necessarily represent the views of the speaker.

They also outline an example model for calculating the valence of words. Each word has a basic valence which is then modified by the valence shifters in whose scope it appears. For example, the basic valence of *clever* is +2, and the negator *not*

changes the sign of the valence; therefore, the valence of *not clever* is -2. The basic valence of *efficient* is +2, and the weakening intensifier *rather* reduces the valence; therefore, the valence of *rather efficient* is +1.

Kennedy and Inkpen (2005; 2006) evaluate the effect of the valence shifters on the sentiment classification task. They perform the sentiment classification by simple counting, in two different ways. First, they do the calculations ignoring the valence shifters, and then they do the calculations taking the valence shifters into account. Only a limited number of valence shifters are considered. These include overt negators like *not*, and intensifiers like *deeply*, *barely* and *rather*. The effect of considering the valence shifters is an increase of 1%-3% in precision, depending on the type of texts used for classification and the choice of adjectives used to calculate the semantic orientation.

Polanyi and Zaenen (2006), while discussing more valence shifters than the previous studies, are far from complete in listing the different kinds of the shifters. The semantic orientation of a word is reversed in a negative assertive environment. Below are examples of a sentiment word used in the complement of a negative implicative verb (821), the negative implicative constructions *without* (822) and *too* of excess (823), and the complement of the negative assertive verb *doubt* (824). In all the cases the semantic orientation of the sentence is opposite to that of the verb in italics, due to the reversal effect.

(821) The movie fails to *engage* me.

(822) The movie manages to be moderately funny without being *crude*.

(823) The movie is too slow to be a *satisfying* thriller.

(824) I doubt this stock is a *good* investment.

These constructions should be taken into consideration in the sentiment classification task. Kennedy and Inkpen (2005; 2006) report that recognizing the impact of the overt negators improved the performance of their sentiment classification system. Extending the list of valence shifters recognized by the system

to include the negative assertive constructions may lead to further improvements in its performance.

10.1.2 Assertivity projection

In this section I explore the issue of assertivity projection. The question of projection of clausal properties can be described as follows: if a subclause *x* has a property A, does the sentence in which the clause *x* is embedded also have the property A?

Two sentential properties whose projection has been discussed in the previous literature are presupposition and implicativity. The issue of presupposition projection was addressed by Karttunen (1973), with his analysis focused on complement-taking predicates. He classifies such predicates into three categories. The first category contains *plugs*, predicates which block off all the presuppositions of the complement sentence. Verbs of saying belong to this category. For example, although (825) presupposes (827), (826) does not presuppose (827):

(825) Harry introduced Bill to the present king of France.

(826) Harry has promised Bill to introduce him to the present king of France.

(827) France has a king.

Another category is *holes*, predicates which let all the presuppositions of the complement sentence become presuppositions of the matrix sentence. An example of such a predicate is *know*: both (828) and (829) presuppose(827).

(828) Bill met the present king of France.

(829) I know that Bill met the present king of France.

The third category is *filters* predicates which, under certain conditions, cancel some of the presuppositions of the complement. Later research (Heim 1992; van der Sandt 1992) has shown that Karttunen's (1973) analysis is very preliminary, and the presupposition projection is a much harder problem. Nevertheless, Karttunen's terminology is helpful; I will use this terminology, extending it to apply not only to complement predicates, but also to other subordinating constructions.

Another clausal property interesting in this respect is *implicativity*, mentioned in section 4.2 above. An environment F(p) is positive implicative iff F(p) => p. That is, if a sentence entails a subclause, the subclause is in a positive implicative environment. For example, (830) entails that *The door was closed*. On the other hand, an environment F(p) is negative implicative if F(p) => ¬p. That is, if a sentence entails the negation of a subclause, the subclause is in a negative implicative environment. For example, (831) entails that *Ed did not close the door*.

The implicativity sometimes has to be calculated with a number of stacked embeddings, as is the case with (832), which, like (831), entails that *Ed did not close the door*. Calculating implicativity is important in tasks such as recognizing textual entailment (Dagan et al. 2005). This raises the question of implicativity projection, that is, what happens to implicativity under the different embeddings.

(830) Ed forgot that the door was closed.

(831) Ed forgot to close the door.

(832) Ed didn't manage to remember to close the door.

Nairn et al. (2006) propose an algorithm to calculate the relative implicativity, which they call the implication projection algorithm. The algorithm works top down, beginning from the topmost node which represents the entire sentence. The implicativity of each context relative to its ancestors is calculated based on the implicativity of the parent and the embedding of the context within the parent. The algorithm can be used to calculate the implicativity of a context appearing under multiple embeddings.

In the rest of this section I introduce an algorithm for calculating the assertivity projection, adapting the implication projection algorithm proposed by Nairn et al. (2006). In this algorithm, each context C is associated with a set of contexts A(C) containing all the contexts relative to which C is assertive:

(833) A(C) ≡ {x | x is a context/node such that C is assertive relative to x}

A(C) is calculated top-down, beginning with the topmost node, until we get to the node the assertivity of which we are interested in calculating. The calculation is performed as follows:

- For the topmost node, A(C) = {*C*}
- For the other nodes,

  If C is assertive relative to parent(C), A(C) = {*C*} ∪ A(parent(C))

  otherwise, A(C) = {*C*}

If C is assertive relative to parent(C), the embedding of C functions as a 'hole', projecting the assertive force from the parent of C to C. This makes C assertive relative to all the contexts relative to which the parent of C is assertive. This happens, for example, if C is a consequence of a conditional, in the second argument position of a quantifier, or a complement of an assertive verb.

If, on the other hand, C is not assertive relative to parent(C), the embedding of C functions as a 'plug', blocking the projection of assertive force from the parent of C to C. This makes C non-assertive relative to all the contexts in which the parent of C is embedded. This happens if C is an antecedent of a conditional, a restrictor of a quantifier, or a complement of a factive verb. The result is that A(C) contains C and all its ancestors up to the first blocking point, which occurs at the first non-assertive embedding. The formalization of observations of Gärtner (2002) is discussed in section 6.4.2 above.

I will demonstrate the calculation on the following example:

(834) [If [he's too tired [to come]$_{p'}$]$_{p}$, [I'll manage [to play the guitar]$_{q'}$]$_{q}$] $_{z}$.

Let's start with the topmost context z. Since it is the topmost node, A(z) is z. The subclause q is assertive relative to z, since the apodosis of the conditional is an assertive environment. Therefore A(q) = {q} ∪ A(parent(q)) = {q} ∪ A(z) = {q}∪{z} = {q,z}. The subclause q' is assertive relative to q, since *manage* is a positive implicative verb, creating an assertive environment. Therefore A(q') = {q'} ∪ A(parent(q')) = {q'} ∪ A(q) = {q'} ∪ {q,z} = {q',q,z}. Adapting Karttunen's

terminology, both embeddings are ‘holes’ for assertivity, allowing the projection of the assertion from the topmost matrix clause to the twice-embedded q'.

The subclause p is the antecedent of a conditional, so it is not assertive relative to z, Therefore A(p) = {p}. In this sentence, this is the only case of plug-type subordination, with *p* not inheriting the A set of its parent. The subclause p' is assertive relative to p, since *too* of excess creates a negative implicative environment. Therefore A(p') = {p'} ∪ A(parent(p')) = {p'} ∪ A(p) = {p'} ∪ {p} = {p',p}.

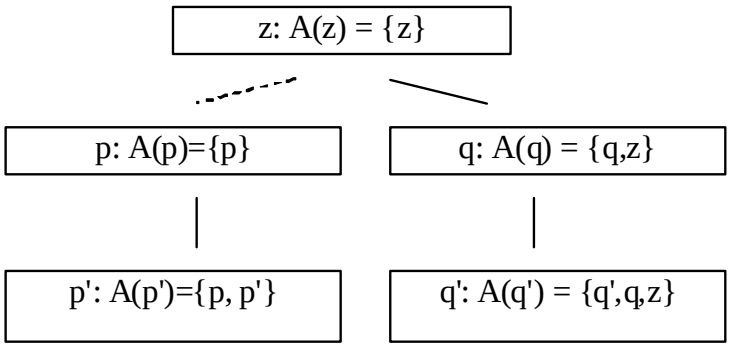

Figure 2: Calculating A(C); Solid line: ‘hole’, projecting assertivity [A(C) = {*C*} ∪ A(parent(C))]. Dashed line: ‘plug’, blocking assertivity [A(C) = {*C*}].

After the algorithm is performed, the clauses that are assertive relative to z can be identified using their set A as follows: a subclause x is assertive relative to z iff z ∈ A(x). In the example above, z ∈ A(q) and z ∈ A(q'), so both q and q' are assertive relative to z. On the other hand, z ∉ A(p) and z ∉ A(p'), so both p and p' are not assertive relative to z. This example shows how one embedding can affect a number of clauses. In this case, the embedding of *p* in *z* also affects p': both p and p' are not assertive relative to z since the embedding of p in z is of a type that blocks the projection of assertivity.

The algorithm described here can be used when dealing with tasks in computational linguistics that can benefit from taking assertivity into account.

10.2 Logical and psycholinguistic classification of quantifiers

10.2.1 Logical and pragmatic symmetry

The notion of semantic negativity can help explain certain behavior of quantifiers. Considerable semantic literature discusses two-argument (type <1,1>) quantifiers, such as *no*, *some*, and *most*, that combine two set-denoting expressions (Barwise and Cooper 1981; Keenan 2004; Peters and Westerståhl 2006). Among the properties of quantifiers usually discussed is their upward or downward monotonicity on the first or second argument (sometimes called left and right argument, respectively). For example, *some* is upward monotone on both arguments, *no* is downward monotone on both arguments, while *every* is downward monotone on the first argument and upward monotone on the second argument. The notion I am interested in this section is *logical symmetry*, defined as follows (Peters and Westerståhl 2006:210):

(835) A type <1,1> quantifier Q is logically *symmetric* iff, for all M and all $A, B \subseteq M$, $Q_M(A,B) \Rightarrow Q_M(B,A)$

Among the quantifiers that satisfy this property are *some*, *no*, and *exactly n*. The monotonicity of such quantifiers is the same on both arguments. The symmetry of these quantifiers can be demonstrated by the logical equivalence of the sentence in the following pairs:

(836) a. Some mediators are lawyers.

b. Some lawyers are mediators.

(837) a. No mediators are lawyers.

b. No lawyers are mediators.

(838) a. Three mediators are lawyers.

b. Three lawyers are mediators.

The logical symmetry, however, should not be taken to mean that the two argument positions of these quantifiers are completely equivalent. There are other differences between the first and the second argument positions that do not influence

the truth conditions. The main difference is that in a natural language, the first argument specifies the domain of the quantification, and is usually regarded as presuppositional. The second argument together with the determiner specify "what is said" regarding the domain of the quantification. Therefore, although a quantifier may be symmetric with respect to the truth condition, they are not symmetric with respect to the discourse roles of the arguments.

The property which concerns us here is the licensing of the negative polarity particles. As noticed in section 4, the negative polarity particles are licensed in the second argument of quantifiers, when it is downward monotone, but they are not licensed in the first argument of the quantifiers, even when it is downward monotone. This is another manifestation of the lack of symmetry between the argument positions of logically symmetric quantifiers. For example, the quantifiers *no* and *few* are symmetric and are downward monotone on both the first and the second argument. Nevertheless, the negative polarity particles are only licensed in the second argument of these quantifiers and not in the first argument:

(839) a. No one of us has ever been to Amsterdam. No one has been to Brussels *either*.

b. No one of us has ever been to Amsterdam. *No one who has been to Brussels *either* wants to go there again some day.

(840) a. Few tourists are here yet.

b. *Few of those who are tourists yet are here.

This asymmetry can be explained in the terms of assertivity. The first argument position of the quantifiers is not assertive, while the second argument position is assertive. Therefore, the negative polarity particles are predicted to occur in the second position when it is downward monotone, and not to occur in the first position of the quantifier. Since both argument positions of *few* and *no* are downward monotone, the negative polarity particles are predicted to occur in the second argument position, which is downward monotone and assertive, that is, semantically negative. The first argument position is not semantically negative, since it is not assertive. This shows

that even the quantifiers with logically symmetric truth conditions are not pragmatically and linguistically symmetric.

10.2.2 Psychological negativity

Some quantifiers, such as *few*, *no*, and *not all* feel negative. On the other hand, *some* and *every* do not feel negative. For example, (841), (842) and (843) have a feeling of conveying negative information, while (844) and (845) do not:

(841) *Few* people enjoyed the show.

(842) *No one* enjoyed the show.

(843) *Not all* the people enjoyed the show.

(844) *Some* people enjoyed the show.

(845) *Everyone* enjoyed the show.

It is common to explain negativity by downward monotonicity. This explanation requires additional clarification in the case of two-argument quantifiers, such as those mentioned above, since they can have different monotonicity on each argument. Which argument affects the feeling of negativity?

Some quantifiers, such as *few*, *some* and *no*, are logically symmetric, and hence the logical properties, including monotonicity, of the argument positions are the same. The quantifiers *few* and *no* are downward monotone on both argument positions, and the quantifier *some* is upward monotone on both argument positions. These quantifiers do not help us to determine which argument position matters.

The quantifiers that give us the answer are those whose monotonicity depends on the argument position. For example, *every* is downward monotone on the first argument position, and upward monotone on the second argument position. Conversely, *not all* is upward monotone on the first position and downward monotone on the second argument position. We have seen above that *every* feels positive, while *not all* feels negative. This suggests that it is the second argument position that matters for the quantifier's negative feel. If a quantifier is upward monotone on the second argument, like *every*, it is perceived as positive, and if it is downward monotone on the

second argument, like *not all*, it is perceived as negative. The monotonicity properties of the first argument do not affect the perceived negativity of the quantifier.

The concept of semantic negativity can explain this observation. The downward monotonicity of the second argument makes the clause semantically negative, since semantic negativity depends on the monotonicity of the sentential predicate. On the other hand, downward monotonicity of the first argument does not make the clause semantically negative. The perceived negativity of the quantfier can therefore be explained by semantic negativity of the clause in which the quantifier appears. If the quantifier introduces semantic negativity, it is perceived as negative, and if it does not introduce semantic negativity, it is not preceived as negative.

The distinction between positive and negative quantifiers appears in various domains of psycholinguistic research, and the classification of the quantifiers into positive and negative is quite consistent. For example, Moxey and Sanford (1993; 2000) discuss the differences between what they call 'positive' and 'negative' quantifiers, without giving a theoretical explanation what they mean under these terms. They list *a few, some, many, most, all* as positive, and *few, hardly any, less than half, not many* as negative (Moxey and Sanford 1993:47). Similarly, they classify the adverb of frequency *often and occasionally* as positive and *seldom/rarely* as negative (Moxey and Sanford 1993:77).

Among the phenomena in which the positive and negative quantifiers behave differently is complement set anaphora[22]. Complement set anaphora are cases, like in the following example, of a pronoun referring to a set complement to the one denoted by an antecedent noun phrase:

(846) Few of the managers attended the meeting. *They* were too busy.

(847) Not quite all the fans went to the football match. *They* were on a bus that broke down and didn't make it.

[22] The connection between the environments allowing complement set anaphora and NPI licensing was also noticed by Sailer (2006).

Complement set anaphora are not possible with positive quantifiers. The following sequences are incoherent, since the pronoun *they* in the second sentence cannot refer to the complement set of the set mentioned in the first sentence:

(848) #Many of the managers attended the meeting. *They* were too busy.

(849) #Some fans went to the football match. *They* were on a bus that broke down and didn't make it.

Geurts and van der Slik (2005) investigate how the choice of a quantifier affects the processing load of a sentence. Their conclusion is that downward monotone quantifiers are harder to process, and the reason they suggest is that inferences from subsets to supersets are easier that inferences in the opposite direction. Another conclusion is that mixed monotonicity is harder to process than a harmonic one.

Geurts and van der Slik only tested the influence of the second argument of a determiner, and ignored the first one, without providing any justification for this choice. It is plausible to assume that the reason in this case is the same as in the cases discussed above: what matters is the semantic negativity of the clause with the quantifier. The second argument position of a determiner is assertive, and the first one is not, so only the second argument position affects the semantic negativity of the clause. Their conclusions regarding downward monotonicity probably do not apply to the first argument position, since it cannot affect the semantic negativity of the clause.

10.3 Assertivity and other notions in NPI licensing

10.3.1 Assertivity, assertoric inertia, and downward assertion

In a series of papers Horn (2002; 2006) introduces the notion of *assertoric inertia* and *downward assertion* to explain NPI-licensing properties of a number of environments. Due to similarity in terms, there may be some confusion between these terms and my notions of assertivity and semantic negativity. In this section I examine Horn's proposal and explain the differences between Horn's definitions and the notion of assertivity proposed in this study.

The purpose of Horn's notions of downward assertion and assertoric inertia is to account for the distribution of the different negative polarity items, including *any* and

ever. This is different from my goal, which is to account for the behavior of negative polarity particles, which are more restricted. The main motivation Horn suggests for introducing his notions is the NPI-licensing properties of the words *almost* and *barely*. I examined these words in section 8.7 above; for convenience, I will repeat some of the analysis here. Both *almost* and *barely* have two meaning components: the polar component and the proximal component. The phrase "*almost X*" has the polar component "*not X*" and the proximal component "X is/was close". The expression "*barely X"* has the polar component "X" and the proximal component "*not X* is/was close".

For example:

(850) My printer is <u>almost</u> functional.

polar component: My printer is not functional

proximal component: My printer is close to being functional.

(851) My printer is <u>barely</u> functional.

polar component: My printer is functional.

proximal: My printer is close to being not functional.

It can be seen that *almost* has a negative polar component and a positive proximal component. The word *barely* is the opposite: it has a positive polar component and a negative proximal component. As noted above, it is the proximal component that influences the licensing and not the polar one. While *barely* licenses NPIs (735), *almost* does not (734).

(852) *She almost *slept a wink*/spoke to *anyone*.

(853) She barely *slept a wink*/spoke to *anyone*.

Horn (2002) explains this fact in terms of *assertoric inertia*. According to his analysis, both the proximal and the polar component are entailed by the sentences. The difference is that while the proximal component is asserted, the polar component is not asserted; the polar component is *assertorically inert*. Only the asserted component

influences the NPI-licensing. Horn rejects the notion of *downward entailment* and replaces it with *downward assertion*.

This proposal, however, is not novel. It has been suggested earlier that downward monotonicity has to be examined with the presuppositions of both sentences satisfied (Ladusaw 1980b; von Fintel 1999). That is, the presupposition is excluded from the examination of monotonicity. Therefore, the proposal made by Horn (2002) is very similar to the notion of *Strawson-downward monotonicity* (von Fintel 1999).

Thus, the condition of downward assertion proposed by Horn (2002) is actually equivalent to downward monotonicity as used in this study, and as such it is strictly weaker than semantic negativity. This is not surprising, since Horn's goal is to account for the distribution of negative polarity items like *any*, *ever*, and the minimizers, and not for the more restricted negative polarity particles. Another important difference is that Horn's condition is a property of a constituent environment, such as NP or VP, while assertivity is a property of clausal environment.

The differences between the two conditions can be demonstrated by a number of examples. The antecedent of a conditional is an environment which is assertorically downward monotone, since it is part of the assertion, and it is downward monotone. However, this environment is not assertive, since asserting the entire sentence does not lead to asserting the antecedent, so the full sentence does not illocutionary entail the antecedent. Accordingly, this environment licenses NPIs like *any* (854), but not negative polarity particles (855).

(854) <u>If</u> you see *any* typos on my blog, please do scream at me.

(855) *<u>If</u> you work there *anymore*, leave.

Similarly, restrictors of quantifiers that are downward monotone on the first argument, such as *every* and *no*, are assertorically downward monotone, but not assertive. This environment also licenses NPIs like *any* and *ever* (856), but not negative polarity particles (857).

(856) <u>Everyone</u> who has *ever* lived in Charlottesville has played a role in its ongoing story.

(857) No one of us has ever been to Amsterdam. *Everyone/*No one who has been to Brussels *either* wants to go there again some day.

To conclude, the definitions given by Horn are different from those in this study, and were proposed for different purposes. Horn did not address the question of the licensing of negative polarity particles, and his definitions therefore do not serve this purpose.

10.3.2 Assertivity and veridicality

In a number of papers, Giannakidou proposes the concepts of veridicality, nonveridicality, and anti-veridicality to explain the distribution of different kinds of negative polarity items and other items with restricted distribution. In its basic form, these concepts are defined as follows (Zwarts 1995; Giannakidou 1999):

(858) Let O(p) be a sentential operator. O is *veridical* iff O(P) => p is logically valid. O is *non-veridical* iff O is not veridical. O is *anti-veridical* iff O(p) => ¬p is logically valid.

According to the condition of (non)veridicality, negative polarity items are only expected to occur in non-veridical environments. Some negative polarity items with a limited distribution are only expected to occur in anti-veridical environments.

It is interesting to note that veridicality and implicativity are two terms for the same notion. Indeed, the definition of an implicative environment, repeated below, is identical to the definition of veridicality:

(859) F(p) is implicative iff F(p) => p

Assertivity is a concept which is similar to implicativity. While implicativity is based on entailment, assertivity is based on illocutionary entailment. There are a number of cases in which these concepts differ. For such cases, I would like to examine whether the NPI licensing is better predicted by implicativity or assertivity. If assertivity describes the facts better, this would suggest that Giannakidou's proposal should be modified to use assertivity and not veridicality.

One aspect in which implicativity and assertivity differ is in the treatment of presuppositions. If *p* in F(p) is entailed and presupposed, it is not illocutionary entailed. In such cases, the environment F(p) is implicative, but nor assertive. One example of such an environment is the complement of emotive factive verbs, such as *glad*, *regret* and *sorry*. As earlier literature has shown, such verbs, especially the ones conveying negative emotions, license negative polarity items, as seen in (860) and (861) below. This fact runs contrary to the predictions of a veridicality-based explanation. Since the complement of emotive factives is clearly an implicative environment, the NPIs are predicted not to occur in it, contrary to fact.

(860) I regret that I *ever* went to Spain.

(861) I'm sorry *anyone* was upset by what I said.

Giannakidou (2006:595-598) attempts to explain this fact by introducing the notion of 'rescuing'. She proposes that "certain polarity items can be rescued in the scope of a veridical expression like *only* if this expression also generates a nonveridical inference". This is formulated as a *rescuing condition* in (862):

(862) A polarity item α can be rescued in the scope of a veridical expression β in a sentence S, if (a) the global context of C of S makes a proposition S' available which contains a nonveridical expression β; and (b) α can be associated with β in S'.

For example, the licensing of the NPI *ever* in (860) is explained by the following inference:

(863) I regret that I went to Spain => I would prefer it if I had not gone to Spain.

This is reminiscent of Linebarger's licensing condition and suffers from the same problem of overgenerating: it is possible to find similar inferences even from plain veridical sentences, as in the following example:

(864) Eventually, I went to Spain => It was possible that I wouldn't go to Spain.

Giannakidou claims that rescuing should be used in fewer cases than Linebarger's condition, but eventually concludes without determining when rescuing is possible, and when it is not, leaving this task to further research. Interestingly, it seems that the

second sentence in (863), *I would prefer it if I had not gone to Spain* is in fact veridical relative to the original clause *I went to Spain*, as it entails *I went to Spain*. We can therefore put the rescuing condition aside and conclude that the veridicality condition cannot explain the licensing of the negative polarity items in emotive factives.

The situation is different with assertivity. The complement of emotive factives is not assertive. Therefore, if the condition of veridicality is replaced with assertivity, the prediction in the case of emotive factives becomes correct.

Another environment which is problematic for the condition of veridicality is sentences with *almost* and *barely*. Briefly repeating the observations above, *almost X* entails *not X*, and *barely X* entail *X*; *almost X* does not license negative polarity items, while *barely X* does. *Almost X* is therefore antiveridical, and *barely X* is veridical. Since negative polarity items are expected to occur only in non-veridical environments, the prediction of the condition of veridicality is that NPIs would occur in the non-veridical *almost X*, and will not occur in the veridical *barely X*. This prediction is contrary to the facts.

Giannakidou (2006:599) attempts to explain the fact that negative polarity items are not licensed by *almost* (she does not address the question of negative polarity items being licensed by the veridical *barely*). She challenges Horn's analysis of *almost X*, in which *almost X* entails *not X*, and supports an alternative analysis by Sadock (1981). According to that analysis, *almost X* does not entail *not X*, it only implicates *not X*, and the implication is cancelable. This analysis is supported by the following examples, in which the cancelation of the negative inference does not result in contradiction:

(865) a. John bought almost five books; in fact, he bought EXACTLY five.

b. John is almost an idiot; in fact he IS an idiot.

To the extent that this claim is correct, it shows that *almost X* is not anti-veridical. It is clear that *almost X* is non-veridical, that is, *almost X* does not entail *X*. Therefore, *almost X* is still expected to license negative polarity items. Moreover, the negative implication would also license NPIs under the 'rescuing' condition. Therefore, even

under the alternative analysis of *almost*, veridicality does not correctly predict the non-licensing of negative polarity items with *almost*.

Can assertivity alone do better? A*lmost* and *barely* are adverbs that do not introduce subordination, so both *almost X* and *barely X* are assertive clauses. If we replace veridicality with assertivity, then the prediction would be that neither *almost* nor *barely* license negative polarity items. The prediction is correct for *almost*, but not correct for *barely*. While this is better than the condition of veridicality, which gives the wrong prediction for both *almost* and *barely*, it is evident that this is not the correct explanation for the licensing properties of these environments, either.

A third kind of environment which is problematic for the condition of veridicality is the complement of assertive verbs such as *think* and *believe*. These complements are not implicative; that is, *I think that p* does not entail *p*. Nevertheless, negative polarity items are not licensed by verbs such as *think* or *believe*:

(866) I think I lost something/*anything.

Giannakidou (1999:388) addresses this issue by modifying the condition of veridicality. Instead of veridicality as defined above, she defines "relativized veridicality" as shown in (867) below. These environments are veridical according to the modified definition, and this fact is used to explain the non-licensing of the negative polarity items.

(867) A propositional operator *Op*(p) is veridical iff it holds that $[[Op(p)]]_c = 1 \Rightarrow [[p]] = 1$ in some epistemic model $M(X) \in c$; otherwise *Op* is nonveridical.

Although the complements of *think* and *believe* are not veridical, they are assertive. Therefore, choosing assertivity instead of veridicality explains the non-licensing of the negative polarity item, without the need to introduce the relativized definition.

In the environments examined in this section there was no case in which replacing veridicality by assertivity made the predictions worse. In some cases assertivity gave better predictions than veridicality, and in some cases the predictions were the same.

My conclusion is that using assertivity instead of veridicality gives better results in predicting the distribution of negative polarity items discussed by Giannakidou.

11 The Negative Polarity Particles in other languages

11.1 Introduction

The discussion of the negative polarity particles in most of this study is limited to English. In this section I examine a number of negative polarity particles in other languages, and compare the situation to what happens to English. Some particles are of the kind found in English as well: negative additive particles (section 11.2) and discontinuative aspectual particles (section 11.3). Some particles are of the kind not found in English: contrastive clausal particles (section 11.4).

One of the goals of examining the particles in the different languages is to determine whether the licensing condition of *semantic negativity* (590) applies crosslinguistically. To accomplish this goal, for each negative polarity particle I examine in what environments it occurs, and to what extent the behavior of the particle can be explained by semantic negativity. The conclusion reached at the end of this section is that the negative polarity particles described here only appear in semantically negative clauses, that is, semantic negativity is a necessary licensing condition for these particles. The distribution of the negative polarity particles discussed in this section is more restricted than that of their English counterparts. None of the NPPs in the other languages occurs in all the environments in which the English NPPs can occur. The question whether conditions stronger than semantic negativity can be found to account more closely for those NPPs is left to further research.

11.2 Negative additive particles

We have seen two negative additive particles in English: *either* and *neither*. The difference between these particles is that while *either* must appear in a negative clause with negation expressed independently, *neither* introduces negation into the clause in which it appears. Negative polarity particles in Romance languages, such as French *non plus*, Spanish *tampoco*, and similar words in Italian and Catalan, can usually function in both these roles. They can appear in a negative clause in which the negation is introduced independently, like *either*, in which case they just signal

negative additivity. They can also appear without syntactic negation in the clause, like *neither*, in this case they both introduce the negation and signal negative additivity. This phenomenon, in which a word can both introduce negation in a clause otherwise without negation and be used in a negative environment without introducing another negation, is usually called *negative concord* (Herburger 2001).

These words are rarely discussed in the literature on negative polarity items. For example, *non plus* is not listed as an NPI in a recent survey of French polarity sensitive items (Tovena et al. 2004). However, their distribution depends on negativity, just like that of *neither* and *either*.

Let's examine the French expression *non plus*, starting with the usage in which it is similar to the English *either*. In this usage *non plus* is added at the end of the host clause, and it does not introduce negation, for example:

(868) Pierre est riche. Jean n'est pas pauvre non plus.

Pierre is rich. Jean NEG'is NEG poor *non plus*.

'Pierre is rich. Jean is not poor either'.

Corblin (2005:3) remarks on this usage: "*Non plus* must be licensed by negation. The host sentence must contain a negative expression: negative marker or N-word". This turns out not to be a precise description, as *non plus* can also be found in some environments that do not contain a negative expression such as a negative marker or an N-word. Some examples from the Internet are:

(869) C'est une méthode rarement employée….

This-is a method rarely used

'This is a rarely used method'

C'est un opération longue et donc coûteuse, rarement employée *non plus*.

This.is an procedure long and therefore costly, rarely used *non plus*.

'This is a long and costly procedure, also rarely used'.

(870) Et en plus je suis arrivé au milieu d'un orage comme je n'en avais encore

And in more I am arrived in middle of'a thunderstorm like I not have yet

jamais vu ici !!! Et à vrai dire comme j'en ai rarement vu en France *non plus* !!!

ever seen here. And to true tell like I have rarely seen in France *non plus.*

'And in addition I arrived in the middle of a thunderstorm like I've never seen here. And to tell the truth, like I have rarely seen in France either'.

(871) Nous ne sommes pas tous des goujats, et je doute que ton mec

We not are not all the rude, and I doubt that your boyfriend

en soit un *non plus*.

PRT be-SUBJ one *non plus*.

'We are not all rude, and I doubt your boyfriend is rude either'.

(872) Elle découvrit qu'elle était maintenant trop humaine pour redevenir jeune

She discovered that she was now too human to become-again young

et partir sur les chemins, mais trop immortelle pour mourir *non plus*.

and leave on the roads, but too immortal to die *non plus*.

'She discovered that she was too human to become young again and get on the road, but also too immortal to die'.

Although the environments above in which *non plus* appears are not syntactically negative, they are all semantically negative. Using *non plus* when the host sentence is not semantically negative results in ungrammaticality (873). This shows that semantic negativity is a necessary licensing condition for this usage of *non plus*.

(873) *Je ne parle pas allemand. Si vous parlez allemand non plus,

I not speak not German. If you speak German *non plus*

vous pourrez m'aider.

you will-be-able me help.

'I don't speak German. If you speak German *non plus*, you will be able to help me.

The other usage of *non plus* is similar to that of English *neither*. In this usage *non plus* introduces a VP-ellipsis and negation, as in the following example:

(874) Je ne suis jamais allé à Rome, et à Paris *non plus*.

I NEG am ever gone to Rome, and to Paris non plus.

'I have never been to Rome, and I haven't been to Paris either".

In this case the negativity requirement is on the antecedent clause. This usage of *non plus* is listed by by Corblin and Tovena (2003:5) and Godard (2004:3) as a test for the negativity of the antecedent clause. According to Godard (2004), the negative words in French are: *personne* 'nobody', *rien* 'nothing', *aucun* 'no', *nul* 'none', *pas un* 'not one', *pas* 'not', *plus* 'no more', *jamais* 'never', *aucunement, nullement* 'no way', *sans* 'without', *ni ..ni* 'neither ..nor'. Therefore, this usage of *non plus* is expected to occur only when one of these words is present in the antecedent. However, this usage of *non plus* can sometimes occur although the antecedent does not contain any of the overt negation words from the list above. For example:

(875) Je doute que Penny vous fasse de nouveau confiance et à moi *non plus*.

I doubt that Penny you make again trust and me *non plus*.

'I doubt that Penny will trust you again, and she won't trust me either'

(876) Après tout, qui aurait cru que même avec cette défense inédite, Tel Aviv nous

After all, who would-have believed than even with this defense new, Tel Aviv

en planterait 4 ? Peu de gens, et Lacombe *non plus*, je le comprends.

us it will-plant 4? Few of people, and Lacombe *non plus*, I him understand.

'After all, who would believe that even with this new defense, Tel Aviv will "plant" us 4? Few people, and Lacombe *non plus*, I understand him.

(877) Le personnel parle à peine anglais (français *non plus*)

The staff speaks barely English (French *non plus*)

'The staff barely speak English, and they barely speak French either.'

(878) Je doute que vous viviez dans une hutte et moi *non plus*.

I doubt that you live.SUBJ in a hut, and I *non plus*.

'I doubt that you live in a hut, and neither do I'.

In all these cases, the antecedent is *semantically negative*. Using *non plus* when the antecedent is not semantically negative results in ungrammaticality:

(879) *Je suis sûr que tu parles allemand, et moi *non plus*.

I am sure that you speak German, and I *non plus*.

'I'm sure you speak German, and I don't'

(880) *Le personnel parle anglais (français *non plus*)

The staff speaks English (French *non plus*)

'The staff speak English, and French as well / but not French.'

The conclusion is that *non plus*, in both its usages, can be licensed by a semantic negativity even if an explicit negative word is absent. Similar behavior is observed with Spanish *tampoco* (see section 11.4 for discussion of *tampoco*). Neither *non plus* nor *tampoco* can be found in environments which are not semantically negative. This suggests that semantic negativity is a valid and necessary licensing condition for negative additive particles crosslinguistically.

11.3 Discontinuative aspectual particles

In this section I examine the distribution of another kind of negative polarity particle, namely the discontinuative aspectual particles. These are particles whose meaning is similar to English *anymore*. I examine these particles in German and Russian, two languages among those that have such a particle. In both German and Russian the appropriate particle is licensed by more environments than just syntactic negation.

In German, the word is *mehr* 'more'[23], and it cannot appear in a simple positive sentence:

[23] Most German examples are taken from (Kürschner 1983:4.2).

(881) Peter raucht *(nicht) *mehr*.

Peter smokes not more.

'Peter doesn't smoke anymore'.

Although the particle is frequently cited as *nicht mehr*, other forms of negation can be used with this meaning as well:

(882) Peter raucht keinesfalls *mehr*.

Peter smokes not-at-all more.

'Peter doesn't smoke at all anymore'.

As observed in (Kürschner 1983:4.2), this use of *mehr* is also allowed in a number of environments without overt negation:

(883) Seitdem wir aufs Dorf gezogen sind, gehen wir selten *mehr* ins Kino.

Since we into-the village moved are, go we seldom more in cinema.

'Since we have moved to the countryside, we (now) rarely go to the cinema.'

(884) Madame Millet hat wenig Hoffnung *mehr*.

Madame Millet has little hope more

'Madame Millet has little hope now. / Madame Millet has little hope left.'

(885) Leben ist hier kaum *mehr* möglich.

Life is here barely more possible.

'Life is barely possible here now.'

All these environments are semantically negative. Therefore, semantic negativity is a necessary condition for the aspectual *mehr* in German. However, it is not a sufficient condition. There are many semantically negative environments in which the aspectual *mehr* is not licensed:

(886) *Ich bin zu müde, um *mehr* zu arbeiten.

I am too tired, to more to work.

'I am too tired to work anymore'

(887) *Er weigerte sich, dort *mehr* zu wohnen.

He refused self, there more to live.

'He refused to live there anymore'

(888) *Ich zweifele, daß er dort *mehr* wohnt.

I doubt that he there more lives.

'I doubt he lives there anymore'.

In Russian, the corresponding discontinuative aspectual particle is *bol'she* 'more'. This particle is licensed by overt negative words, and it cannot appear in a simple positive sentence:

(889) On zdes' *bol'she* *(ne) rabotaet.

He here more not works.

'He doesn't work here anymore'

Boguslavskij (1996:300) claims that *bol'še* can be used only with sentential negation *ne* and predicates incorporating the negation such as *nel'zja* 'not allowed':

(890) Tebe nel'zja zdes' *bol'she* ostavat'sja.

You.DAT cannot.IMPERS here more stay.INF

'You can't stay here anymore'

However, I was able to find a case in which *bol'she* is licensed in a sentence that does not have syntactic negation. The negative implicative verb *otkazat'sja* 'refuse' can also license the aspectual particle *bol'she*:

(891) Ja otkazalsja *bol'she* na nej ezdit'.

I refused more on it drive.

'I refused to drive it any more'.

This environment is also semantically negative. Other semantically negative environments do not license this particle:

(892) Ja sliškom ustal, čtoby (**bol'še*) otvečat' na tvoi voprosy.

I too tired, that more answer at your questions

'I'm too tired to answer your questions anymore'.

(893) My redko (**bol'še*) xodim v kino.

We rarely more go to cinema.

We rarely go to the movies anymore.

(894) Tam malo kto (**bol'še*) rabotaet.

There few who more works.

'Few people work there (anymore)'.

The examples above show that while semantic negativity is a necessary condition for licensing the aspectual particle *bol'še* in Russian, it is not a sufficient condition.

11.4 Particles of clausal polarity: additivity and contrast

The particles discussed thus far belong to one of the three following classes. First, there are additive particles denoting additivity between clauses: positive additive particles *so/too* usually coordinating two positive clauses and negative additive particles *either* and *neither* coordinating two negative clauses. Second, there are additive aspectual particles denoting additivity between different times: the positive additive (continuative) particle *still* and the negative additive particle *yet*. Third, there are contrastive aspectual particles, denoting contrast between different times: the particle *already*, contrasting a negative situation in the past with the positive situation in the current time, and the particle *anymore*, contrasting a positive situation in the past with a negative situation in the current time. A question arises whether a fourth class exists, that of contrastive clausal particles. Such particles would contrast a positive host clause with an antecedent negative clause, or, vice versa, a negative host clause with an antecedent positive clause.

Although such particles do not seem to exist in English, they do exist in some Romance languages, such as Spanish, Catalan, and French. Spanish, like English, has two additive particles that correspond to English *too/so* and *either/neither*; these are

también and *tampoco*, respectively. The particle *tampoco* is used to coordinate two negative clauses. The particle *también* usually combines two positive clauses, while it can occasionally be used with two negative clauses. The following Spanish examples are from Brucart (1987:134):

(895) Luis habla inglés, y yo *también*. [positive-positive]

Luis speaks English, and I too.

'Luis speaks English, and so do I'.

(896) Luis no habla inglés, y yo *tampoco*. [negative-negative]

Luis not speaks English, and I neither.

'Luis doesn't speak English, and neither do I'.

Spanish has two additional particles that can be used to express contrast between clauses. The particles are polarity particles *sí* 'yes' and *no* 'no'. The main use of these words are independent sentential particles, just like *yes* and *no* in English. However, in Spanish these words can also be used as contrastive clausal particles. The particle *no* 'no' is used in a negative clause, to contrast it with an earlier positive clause (897). The particle *sí* 'yes' is used in a positive clause, to contrast it with an earlier negative clause (898):

(897) Luis habla inglés, pero yo *no*. [positive-negative]

Luis speaks English, but I not.

'Luis speaks English, but I don't'.

(898) Luis no habla inglés, pero yo *sí*. [negative-positive]

Luis not speaks English, but I yes.

'Luis doesn't speak English, but I do'.

Similar data for Catalan are discussed by Busquets (1999). The following table summarizes the dependence of the clausal particles on the polarity of the host and the antecedent clause:

previous \ current clause	positive	negative
positive	positive additive: *también* [and so do(es) NP]	positive-negative contrast: *no* [but NP do(es)n't]
negative	negative-positive contrast: *sí* [but NP do(es)]	negative additive: *tampoco* [and neither do(es) NP].

Table 15. Contrastive and additive clausal particles in Spanish.

The validity of the particles' usage depends on the polarity of the antecedent clause. Two of the four particles require the antecedent clause to be positive: *también* usually combines a positive host clause with a positive antecedent clause, while *no* contrasts a negative host clause with a positive antecedent clause. The other two particles require the antecedent clause to be negative: *tampoco* combines a negative host clause with a negative antecedent clause, and *sí* combines a positive host clause with a negative antecedent clause.

Since both *sí* and *tampoco* require the antecedent clause to be negative, they are negative polarity particles. Both Brucart (1987) and Busquets (1999) assume that the requirement of negativity is syntactic, that is, the antecedent clause must be syntactically negative for the sentences with this use of *sí* and *tampoco* to be grammatical. Bosque (1980) expresses the same opinion regarding *tampoco*. Nevertheless, there are cases in which these particles are used, while the antecedent clause is not syntactically negative. In all the cases I was able to find, the antecedent clause was *semantically negative*, according to the definition proposed in this thesis. If the antecedent clause is not semantically negative, the sentence with the particle *sí* is ungrammatical (904). This shows that semantic negativity of the antecedent clause is a necessary condition for the licensing of the negative polarity particles in Spanish.

(899) No se si me recuerdes, *pero yo sí*.

Not know if me remember-2.SG, but I yes.

'I don't know if you remember me, but I remember you'.

(900) Dudo que alguien lo haya notado, *pero yo sí*.

Doubt that someone it has noticed, but I yes.

'I doubt that anyone noticed it, but I did'.

(901) Pocos lo debieron hacer. *Pero yo sí*.

Few it had do. But I yes.

'Few people had to do it. But I did (have to do it)'.

(902) La secretaria difícilmente bebería vino (y él *tampoco*). (Ibáñez 1972:31)

The secretary unlikely drank wine (and he neither).

It's unlikely that the secretary drank wine, and neither did he.

(903) Veo poca televisión, y cine *tampoco*.

I-watch few TV, and cinema neither.

I rarely watch TV, and I don't go to the cinema either.

(904) *Estoy seguro que alguien lo ha notado, *y yo sí*.

Am sure that someone it has noticed, and I yes.

'I'm sure that someone noticed it, and I did too'.

In some cases, even though the antecedent is semantically negative, the particles *sí* and *tampoco* are not licensed.

(905) *Ellos rehusaron [a pagar], *pero yo sí*.

They refused to pay, but I yes.

'They refused to pay, but I paid'.

This shows that semantic negativity is not a sufficient licensing condition. It is possible that there is a syntactic restriction and the non-finite form of the antecedent prevents the particle *sí* from being licensed.

As we have seen, all four combinations exist. Just like aspectual particles, that can be additive or contrastive, clausal particles can also be additive or contrastive. In all the cases, semantic negativity is a necessary condition for the licensing of the negative polarity particles.

12 Conclusions and Further Research

12.1 Conclusions

The main contribution of this thesis is in identifying a class of negative polarity items, examining their distribution and proposing a licensing condition. I demonstrated the similarities between the negative aspectual particles and the negative clausal particles and showed that the condition of semantic negativity explains their distribution. The empirical findings and theoretical explanations in this thesis improve the descriptions formulated in the earlier studies.

Some of the negative polarity particles investigated in this thesis have been discussed in the prior literature. Of the particles discussed in this thesis, the one that has received the most attention in the polarity sensitivity literature is the negative additive particle *either*. Its distribution has been examined extensively in earlier works and it was demonstrated that the accepted licensing conditions do not describe adequately the distribution of this particles. However, the proposed alternative conditions were not much better in describing the distribution of *either*. The condition of semantic negativity is a significant improvement over the conditions proposed in the earlier literature.

On the other hand, the word *neither* was mostly ignored in the polarity sensitivity literature. When it was discussed, it was usually seen as a 'test of negativity'. The concept of 'negativity' for which *neither* is a test was never consistently defined, and no formal descriptions of its distribution have been suggested. In this paper I treat *neither* as a negative polarity particle, and, in general, as a negative polarity item, and propose the condition of semantic negativity that explains when *neither* can be used.

The negative aspectual particles *yet* and *anymore* were usually discussed with respect to their aspectual properties. In that context it was assumed that they require a syntactic negation. I have shown that they can also be licensed in other semantically negative environments. These particles, especially *yet*, were also discussed to some extent in the polarity sensitivity literature, but they have never been the main focus of investigation, and their distribution has never been fully examined. The distribution of

these particles has been examined in this dissertation, and the licensing condition of semantic negativity gives the explanation for their distribution.

The discussion of Negative Polarity Particles as a class of negative polarity items having similar structure and licensing conditions contributes to our understanding of the variety of negative polarity items.

12.2 Further research

The definition of semantic negativity depends on the condition of assertivity. The definition of assertivity, in turn, depends on the definition of illocutionary entailment. The way that condition is defined is not entirely formal and in some cases it is not clear whether it can be applied unequivocally. The tests for assertivity proposed in order to help with this issue aid in clarifying the picture somewhat, but not completely. One direction for further research is to try to develop a more formal definition for the condition of semantic negativity that would predict the observed data. It would also be helpful to find better tests for assertion.

Another area for further research is improving the empirical adequacy of the proposed licensing condition. In some cases the negative polarity particles are licensed in an environment which is not semantically negative. The negative aspectual particles *yet* and *anymore* can sometimes be licensed by a superlative clause, which is not an assertive environment. The negative polarity particles are licensed in interrogative sentences, which are not semantically negative. The condition of semantic negativity predicts that the NPPs are licensed in the complements of assertive verbs only in first person present tense form. However, the NPPs can be licensed in the complements of such verbs regardless of their form.

In other cases the NPPs do not occur in environments which are semantically negative. The complement of *only* is semantically negative, yet licensing of the NPPs in this environment is very limited. The licensing by the quantifiers *only X* and *nobody but X* is expected to be the same, but the latter licenses the NPPs freely and the former almost never. The same holds for the quantifiers *at most n* and *not more than n*. It seems that the surface negativity contributes to the licensing of the negative polarity particles, and this is not represented in the condition of semantic negativity. These

problems are not unique to negative polarity particles; the contrasts in the licensing properties within these pairs of quantifiers are also problematic for the licensing of other negative polarity items.

The same licensing condition of semantic negativity was proposed for all the negative polarity particles discussed in this thesis. In fact, I have observed that some items have a wider distribution than others. For example, while the negative aspectual particles *yet* and *anymore* can be licensed by the superlative, *either* and *neither* cannot. Whether a hierarchy can be established among the NPPs with respect to their distribution also remains a question for further research. In the case that such a hierarchy is established, it would be helpful to find the reasons for the difference in the distribution.

Another issue left for further research is the connection between the syntactic properties of the NPPs and their licensing condition. It was suggested that the reason for the licensing condition of semantic negativity is that the NPPs signal the negative argumentative orientation which only occurs in semantically negative clauses. It would be helpful to explain why other negative polarity articles do not develop sensitivity to this condition. This would improve the understanding of the unique position of the negative polarity particles among the other classes of negative polarity items.

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