

Even, Polarity, and Scope

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Abstract

Two theories of the interaction between *even* and negative polarity licensors are evaluated. It is argued that Rooth's analysis, which claims that English *even* is lexically ambiguous, is superior to that of Wilkinson and others, according to which *even* can vary in scope with respect to the polarity licensor. Arguments against Wilkinson's scope theory come mainly from considerations concerning general restrictions on scope assignment. An alternative explanation for Wilkinson's main argument against Rooth's NPI theory is based on the idea that the existential presupposition introduced by *even* is actually not part of the lexical meaning of that particle but is derived indirectly.

1. Introduction

In a recent article in *Natural Language Semantics* Karina Wilkinson (1996) has argued against the hypothesis due to Rooth (1985) that there are two kinds of *even* in English which differ in the presupposition they introduce as well as in syntactic distribution. According to Rooth, in addition to 'ordinary' *even* there is a negative polarity *even* which only appears in contexts where negative polarity items (NPIs) can occur. For instance, (1) is ambiguous between a reading in which it is assumed that Bill is very likely to hate his father and one in which the opposite assumption is made, namely that it is unlikely that Bill hates his father (F is used here and throughout to mark the constituent carrying intonational focus that is associated with *even*):

- (1) I refuse to believe that Bill even hates [_F his father].

The first reading is brought out in a context like the following:

- (2) I know Bill is a misanthrope who can't stand most people, but I refuse to believe he even hates [_F his father].

The other reading is salient in a discourse such as this:

- (3) Bill has been abused by his father all his life. Nevertheless, Bill is such a good-natured and loving person that I refuse to believe he even hates [_F his father].

The second reading is licensed here because the verb *refuse* is a negative predicate which licenses NPIs in its complement clause:

- (4) I refuse to believe that Bill hates anyone.

Wilkinson argues against Rooth's NPI theory of *even* and in favor of an older analysis going back at least to Karttunen and Peters (1979) and endorsed more recently by Kay (1990) according to which the (potential) ambiguity of *even* in negative polarity contexts is due to *even* being able to take either narrow or wide scope with respect to the negative polarity trigger. On this view (2) represents the narrow scope reading in which *even* has scope in its surface position, while the reading preferred in (3) is obtained by giving *even* scope over *refuse* so that at the level which is the input to semantic representation ('Logical Form') the structure of the sentence is analogous to (5):

- (5) I even refuse to believe that Bill hates [_F his father].

Wilkinson presents a challenging counterexample to the NPI theory, and moreover proposes a solution to the main problem for the scope theory pointed out by Rooth.

In this paper I will defend the NPI theory by showing that (1) the scope theory has to make certain implausible assumptions about the scopal behavior of *even* and its analogues in other languages; and (2) Wilkinson's counterexample against the wide scope theory can be explained by changing our assumptions about the presupposition of *even*. However, I will also argue that it is hard to construct any clear empirical arguments for either theory, in large part because the precise presupposition of *even* is difficult to pin down.

2. Karttunen and Peter's presupposition for *even*

Even is a particle which does not affect the truth conditions of the clause in which it appears, but only serves to introduce a certain presupposition (or conventional implicature as Wilkinson calls it, following Karttunen and Peters 1979). (6) for instance has the same truth conditions as the corresponding sentence without *even*, i.e., (7). For ease of reference I will call the proposition

expressing the truth-conditional content of the clause in which *even* occurs, the target proposition.

- (6) Mary even took John to the movies.
- (7) Mary took John to the movies.

The semantic contribution of *even* consists of a presupposition which relates the target proposition to a certain set of alternative propositions. What these alternative propositions are is determined by intonation (focus) and context. The presupposition of (6) will be different depending on whether the focus is on *John* or on *the movies*:

- (8) a. Mary even took [_F John] to the movies.
- b. Mary even took John to [_F the movies].

In (a) the alternative propositions are of the form “Mary took *x* to the movies”, whereas in (b) they have the form “Mary took John to *x*”. In general, the alternative propositions are (a subset of) the set of propositions obtained from the target proposition by replacing the focused item with a variable of the appropriate type. The context in which the sentence is uttered may serve to further restrict the alternatives. In a conversation about Mary’s roommates John, Paul, George and Ringo, the alternative propositions might be the following (note that the target proposition is itself one of the alternatives):

- (9) {Mary took John to the movies, Mary took Paul to the movies, Mary took George to the movies, Mary took Ringo to the movies}.

The presupposition contributed by *even* says something about the relationship between the target proposition and the alternative propositions, but exactly what it says is a matter of some debate. For the moment I will follow the specific proposal by Karttunen and Peters (1979) which is also adopted by Rooth and Wilkinson. In section 4 I will discuss some other proposals found in the literature which turn out to be relevant for the choice between the scope theory and the NPI theory. According to Karttunen and Peters, the presupposition introduced by *even* can be divided into two parts: it requires (11.i) that at least one of the alternative propositions other than the target proposition must be true, and (11.ii) that the target proposition must be the least likely of all the alternative propositions. (11.i) is called the existential presupposition and (11.ii) the scalar presupposition. Thus a simple example like (10) will have the presupposition given in (11):

- (10) John even invited [_F Bill].
- (11) i. There is someone x ($x \neq$ Bill) such that John invited x (existential presupposition).
 ii. For all x ($x \neq$ Bill) it is less likely that John invited Bill than that John invited x (scalar presupposition).

3. Interaction of *even* with negative polarity licensors

When *even* occurs in a sentence together with negation or some other NPI licenser, the presupposition it introduces is often not what we would expect on the basis of (11). Compare (10) to (12):

- (12) John didn't even invite [_F Bill].

Whereas (10) presupposes that there was someone else besides Bill who John invited and that Bill was the least likely person to be invited by John, (12) presupposes that there was someone other than Bill who John **did not** invite (existential presupposition) and that Bill was **most** likely to be invited by John (scalar presupposition). This means that (12) can not be the negation of (10), as was already pointed out by Horn (1969), because negation is a presupposition 'hole' which passes on the presuppositions of its complement unchanged (in fact, the most popular test for presupposition status is based on this fact). The following two assumptions can therefore not both be true:

- (a) in the LF of (12) *even* is in the scope of negation;
 (b) in (12) *even* introduces the presupposition given in (11).

The scope theory of *even* drops assumption (a) and the NPI theory assumption (b). On the scope theory, the LF of (12) is something like (13):

- (13) even [not [John invited [_F Bill]]]

(For the sake of simplicity I am assuming that both *even* and *not* are sentential operators, but nothing hinges on this.) The scope theory therefore predicts that (12) has the following presupposition:

- (14) i. There is someone x ($x \neq$ Bill) such that John did not invite x (existential presupposition).
 ii. For all x ($x \neq$ Bill) it is less likely that John didn't invite Bill than that John didn't invite x (scalar presupposition).

Assuming that p is more likely than q iff $\neg p$ is less likely than $\neg q$ (i.e., negation inverts the scale of likelihood, or whatever other ordering is relevant for *even*), this is indeed the presupposition we want.

According to the NPI theory, however, the logical structure of (12) is (15), where $even_{NPI}$ is the negative polarity counterpart of ordinary *even* whose occurrence is restricted to the scope of negative polarity licensors:

(15) not [$even_{NPI}$ [John invited [_F Bill]]]

$Even_{NPI}$ introduces a presupposition that is in a sense opposite to that of ordinary *even*. (16) for instance will presuppose (17) (note that (16) will only be grammatical when embedded in the scope of an NPI licensor):

(16) $even_{NPI}$ [John invited [_F Bill]]

- (17) i. There is someone x ($x \neq$ Bill) such that John did not invite x (existential presupposition).
ii. For all x ($x \neq$ Bill) it is more likely that John invited Bill than that John invited x (scalar presupposition).

Because *not* is a presupposition hole, (15) will also have the presupposition (17).

4. Alternative definitions of the presupposition of *even*

Various alternative definitions of the presupposition of *even* have been given in the literature that differ from that of Karttunen and Peters (1979) to a greater or lesser extent. I will not attempt to give a full overview of all proposals that have been made in this area, but will just try to give an impression of the range of variation, while abstracting away as much as possible from differences in theoretical framework. The common core that most authors seem to agree on is that *even* is a scalar particle in the sense that it ranks the target proposition along a certain scale with respect to the set of alternative propositions. The main differences of opinion center around three issues: (i) the principle determining the scalar ranking of the alternative propositions; (ii) the quantificational force of the scalar presupposition, i.e., the relative position of the target proposition on the scale; and (iii) the question of whether *even* actually carries an existential presupposition.

For Karttunen and Peters (1979) *even* ranks the alternative propositions according to their likelihood. Others have argued that the relevant scale involves some notion of pragmatic entailment (Fauconnier, 1975a, 1975b;

Kay, 1990). The problem of defining scales is familiar from the literature on scalar (conversational) implicatures (Horn, 1972, 1989; Gazdar, 1979; Hirschberg, 1985). One case illustrating the difficulties in this area is the following dialogue, inspired by similar examples discussed by Horn:

- (18) A: Is Claire an [_F assistant] professor?
B: No, she's even an [_F associate] professor.

In order to make sense of B's answer in (18) it is not necessary to assume that being an associate professor is necessarily less likely than being an assistant professor (suppose Claire is an established scholar with many publications and a good teaching record), nor is it clear in what sense of entailment (either logical or pragmatic) being an associate professor entails being an assistant professor. The fundamental problem of the nature of scales has not received a satisfactory solution in the literature, and I will not try to solve it here, but it is important to keep this issue in mind when assessing arguments which hinge on intuitions concerning the presuppositions generated by *even*.

Concerning the second issue, the quantificational force of the scalar presupposition, Karttunen and Peters require that the target proposition (i.e., "John invited Bill" in the case of (10)) represents the least likely alternative, and similarly Fauconnier (1975a,b) claims that *even* is associated with the endpoint of a pragmatic scale. Others have argued for a less stringent condition, for instance that the target proposition need only outrank most alternative propositions (as argued, in effect, by Francescotti, 1995) or one particular proposition that is somehow 'present' in the context (Kay, 1990). Against the claim that the target proposition must represent the endpoint of the relevant scale we can cite examples like (19a) (from Kay, 1990) and (b):

- (19) a. Not only did Mary win her first round match, she even made it to [_F the semi-finals].
b. Ed has two children and Fred even has [_F three].

It is clear that the finals are a less likely alternative than the semi-finals, and that three is not the highest number (and in neither case is trying to exclude these alternatives by some mechanism of contextual domain selection a very promising move).

The third disagreement in the literature concerns the question of whether *even* carries an existential presupposition at all. Krifka (1991) and von Stechow (1991) have argued against the existential presupposition on the basis

of examples which involve the focus sensitive particle *only* in addition to *even*, such as (20) (taken from von Stechow, 1991):

(20) Bill even danced only with [_F Sue].

If both *even* and *only* are associated with the the same focused item, *Sue*, then the existential presupposition of *even* would contradict the asserted content of the sentence which due to the presence of *only* entails that Bill didn't dance with anyone other than Sue. Another problem for the existential presupposition is posed by scales consisting of mutually exclusive elements of the kind discussed by Horn (1972). Recall the previous example (18). B's answer certainly does not presuppose that Claire is an assistant professor in addition to being an associate professor. To appreciate the force of the argument it may be useful to contrast (18) and (20) with corresponding sentences involving *too* or *also* instead of *even*:

(21) Bill also danced only with [_F Sue].

(22) A: Is Claire an [_F assistant] professor?

B: No, she's also an [_F associate] professor.

Both these sentences are unfelicitous exactly because they do carry an existential presupposition which is either in conflict with the asserted content of the sentence or with our knowledge about the world. The contrast between (18) and (20) on the one hand and (21) and (22) on the other casts serious doubt on the common assumption that the meaning of *even* is the same as that of *too* plus an additional scalar presupposition (see for instance König 1991). However, simply dropping the existential presupposition from the meaning of *even* will not do either, since in many instances we do have a clear intuition that the use of *even* commits the speaker to something like the existential presupposition. I will come back to this issue in section 7.

It is worth emphasizing that the choice between the scope theory and the NPI theory of *even* in principle is independent of the three points of contention just discussed. Whatever variant we choose for the presupposition of ordinary *even*, the ambiguity of sentences like (1) can be accounted for either by varying the scope of *even* with respect to the NPI licenser, or by assuming that *even* is lexically ambiguous between its ordinary meaning and a corresponding NPI interpretation. However, when it comes to assessing empirical arguments bearing on a choice between the scope theory and the NPI theory, it potentially makes a difference exactly what we suppose the presupposition of ordinary *even* and its NPI counterpart to be. In fact, part of my eventual goal in this

paper is to show that Wilkinson's (1996) arguments in favor of the scope theory turn out not to be convincing precisely because the presupposition she assumes for *even*, that of Karttunen and Peters (1979), is not quite correct. For the moment though, I will continue to keep assuming Karttunen and Peters' version of the presupposition of *even* mainly for purposes of exposition. As we go along I will point out where different assumptions about the meaning of *even* may affect the choice between the scope theory and the NPI theory.

At this point I want to mention one way in which the assumptions about the nature of the scale invoked by *even* can potentially bear on the choice between the two theories, although it is unclear which way the evidence goes. The scope theory relies on the assumption that the negation reverses the scalar presupposition, i.e., that p is more likely than q iff $\neg p$ is less likely than $\neg q$. Now for negation this is probably rather uncontroversial, but for other NPI licensers this assumption may be challenged. It is true that the most popular (and to my mind the most plausible and empirically successful) theory of negative polarity actually defines NPI licensers as scale reversers (Fauconnier, 1979) or downward entailing functions (Ladusaw, 1979). A question that arises with regard to the latter theory is whether the ordering in terms of which downward entailment is defined (logical entailment) is also relevant for *even*. More precisely, is it the case that if a function is downward entailing (in the logical sense) it will reverse whatever scalar ordering plays a role in the presupposition of *even* (such as likelihood or pragmatic entailment)? Because of the difficulty of pinning down the nature of the scale presupposed by *even* it is very hard to answer this question, and I will therefore leave this as an open issue. Perhaps more importantly, there are certain well-known empirical problems for the claim that all NPI licensers are downward entailing (see for example Linebarger, 1987). Such cases include questions, factive predicates, the restrictor for *only*, and superlatives, to mention just a few. In the literature various attempts have been made to deal with such cases, either by reanalyzing the semantics of the relevant constructions, or by refining the notion of downward entailment (for instance, Heim 1984, Kadmon and Landman 1993). If all the problematic cases can be dealt with in this way, it still remains to be seen whether the resulting notion of downward entailment is then sufficient to guarantee reversal of the kind of scale that is relevant for *even*.

Now how does all this affect the choice between the scope theory and the NPI theory? If it turns out that not all NPI licensers are scale reversing in the relevant sense, then this is a problem for the scope theory of *even*, but not for the NPI theory, since in the latter the scale reversing effect is built into the meaning of $even_{NPI}$ itself. (This would leave unsolved the problem of giving a proper characterization of the possible licensers of $even_{NPI}$, but this would be

an instantiation of the general problem of NPI licensing, which exists independently of what we believe about *even*.) On the other hand, if it can be shown that all NPI licensers are scale reversing then—all other things being equal—this would be an advantage for the scope theory, since that theory would then explain why scale reversing occurs, rather than just encoding it in a lexical ambiguity. But this is only an advantage if all other things **are** equal, that is, if the wide scope theory is equally successful (or more successful) than the NPI theory in predicting the right readings for the relevant sentences. In the remainder of this paper I will argue that this is not the case.

5. Restrictions on scope assignment

In this section I discuss certain general problems facing the scope theory which, although they do not constitute a knock-down argument against it, are sufficient to make it very implausible. These problems concern general restrictions on scope and the contradictory combination of properties the scope theory is forced to ascribe to certain analogues of *even* in other languages. Arguments of this kind have already been put forward in the literature (for instance by Rooth 1985 and von Stechow 1991), but it is important to see them in their full force, especially since Wilkinson fails to address them.

One suspicious feature of the scope theory is that it attempts to solve a semantic problem by assigning wide scope to an element without any independent justification that this sort of exceptional scope assignment is actually possible. Other focus particles such as *only* do not take scope over negation in the same way:

- (23) a. John didn't even invite [_F Bill].
b. John even didn't invite [_F Bill].
- (24) a. John didn't only invite [_F Bill].
b. John only didn't invite [_F Bill].
- (25) a. John didn't usually invite [_F Bill].
b. John usually didn't invite [_F Bill].

Whereas (23a) is equivalent to (23b), in which *even* explicitly takes wide scope over the negation, no such equivalence is found in (24a) and (b). The same is true for adverbs like *usually* (see (25)). The claim that *even* can take wide scope over negation makes it unlike any other adverb.

More importantly, the wide scope theory is forced to violate certain well-known restrictions on scope assignment. Take the ambiguous (26):

- (26) They hired no linguist who had even read [_F *Syntactic Structures*].

On one reading of this sentence it is presupposed that *Syntactic Structures* is a book which linguists are likely to have read, whereas the other reading presupposes the opposite, namely that linguists are unlikely to have read *Syntactic Structures*. The latter reading, which according to the scope theory results if *even* remains in the scope of the determiner at LF, is difficult to get for some speakers, a fact which may be explained by assuming that *even* is a positive polarity item. To account for the first reading the scope theory must allow *even* to scope out of the NP it is contained in, so that at LF it gets wide scope over *no*. The resulting interpretation could be paraphrased as follows:

(27) They even hired no linguist who had read [_F *Syntactic Structures*].

Leaving aside the question whether (27) really is a good paraphrase of one reading of (26) (see below for more discussion), this would mean that *even* should be allowed to scope out of the relative clause, something which is otherwise quite impossible even for elements which are known to favor wide scope, such as *each*. (28a) can never have the reading represented in (28b).

- (28) a. They hired no linguist who had read each of Chomsky's books.
b. Each of Chomsky's books is such that they hired no linguist who had read it.

The same problem will arise for other determiners that are downward entailing in their first argument position such as *every*:

- (29) a. They hired every linguist who had even read [_F *Syntactic Structures*].
b. They even hired every linguist who had read [_F *Syntactic Structures*].

The problem for the scope theory is not only that on its account the scope of *even* is not constrained by the usual island conditions, but also that it IS constrained in certain ways which seem alien to the manner in which scope is usually restricted. For example, moving *even* from the relative clause to the matrix should be blocked in the case of non-downward entailing determiners like *a* and *the*. The (a) sentences of (30) and (31) are unambiguous and not equivalent to the (b) sentences. The former presuppose that the linguist who was hired read some other contextually relevant book in addition to *Syntactic Structures*, but this presupposition is absent in the latter.

- (30) a. They hired a linguist who had even read [_F *Syntactic Structures*].
 b. They even hired a linguist who had read [_F *Syntactic Structures*].
- (31) a. They hired the linguist who had even read [_F *Syntactic Structures*].
 b. They even hired the linguist who had read [_F *Syntactic Structures*].

The scope theory is thus forced to say that *even* can take scope over a c-commanding determiner iff that determiner is downward entailing. However, the situation is more complex than this, as demonstrated by (32) and (33):

- (32) a. They didn't hire any linguist who had even read [_F *Syntactic Structures*].
 b. They even didn't hire any linguist who had read [_F *Syntactic Structures*].
- (33) a. They didn't hire the linguist who had even read [_F *Syntactic Structures*].
 b. They even didn't hire the linguist who had read [_F *Syntactic Structures*].

The scope theory must assume that in (32a) *even* can be moved across the determiner *any* to take scope over the matrix negation. Since NPI *any* has the semantics of an existential quantifier, it is upward entailing, and we would therefore expect the wide scope reading to be blocked just as in (30a). Apparently, the presence of the negation in the matrix sentence makes it possible for *even* to take scope out of the relative clause. The same thing does not happen in (33), though. (33b) is not equivalent to (33a).

From the point of view of the NPI theory it is clear what is going on here: a definite determiner prevents a matrix negation from licensing an NPI in the relative clause, but *any* is transparent in that respect:

- (34) a. They didn't hire any linguist who had ever talked to Chomsky.
 b. *They didn't hire the linguist who had ever talked to Chomsky.

The blocking effect caused by *the* may be due to the fact that the definite determiner itself is nonmonotone (i.e., neither upward nor downward entailing) in its first argument. On the NPI theory of *even*, the nonambiguity of (32a) will receive the same explanation as the ungrammaticality of (34b). The scope theory will have to say something like the following: *even* can take wide scope over a c-commanding operator O iff O is downward entailing and the path between *even* and O does not include any downward entailing or nonmonotone elements. What is striking about such a condition on the scope

of *even* is that it mimics the conditions on the licensing of NPIs, but is completely unlike familiar constraints on other scope bearing elements. Although it may be possible to come up with an adequate description of the behavior of *even* in terms of scope, such a description would group it with the wrong set of phenomena, and thereby miss important generalizations.

Another conceptual problem for the scope theory of *even* is revealed when we turn to languages that explicitly mark the contrast between the two types of *even* by using different lexical items. Dutch for instance uses *zelfs* for ordinary *even*, but *zelfs maar* (lit. ‘even only’) or *ook maar* (‘also only’) for *even*_{NPI}. (For an extensive discussion of the latter two expressions and a corpus study of the differences in their meaning and distribution, see Rullmann and Hoeksema, 1997.) A sentence that is ambiguous in English such as (29) is disambiguated in Dutch by the use of either *zelfs* (bringing out the reading in which *Syntactic Structures* is a book linguists are likely to have read) or *zelfs maar* (for the reading in which the opposite is presupposed):

- (35) Zij hebben iedere taalkundige aangenomen die zelfs/zelfs maar [_F *Syntactic Structures*] had gelezen.
 they have every linguist hired who even/even only *Syntactic Structures* had read
 They hired every linguist who had even read [_F *Syntactic Structures*].

Other languages reported to mark the contrast between ordinary *even* and *even*_{NPI} are German (*sogar* vs. *auch nur*), Spanish (*incluso* vs. *siquiera*), Finnish (*jopa* vs. *edes*), and Swedish (*tom* vs. *ens*) (von Stechow, 1991; König 1991; Eva Ejerhed, personal communication). Although in general one can not argue for an ambiguity in one language solely on the basis of the existence of a lexical contrast in another language, these data offer additional cross-linguistic support for the NPI theory, which Rooth originally argued for on completely independent grounds. Moreover, English does have an NPI that has the same meaning as *even*_{NPI}, namely the expression *so much as* (cf. Heim, 1984):

- (36) a. *He so much as looked at me.
 b. He didn't so much as look at me.
 c. If you so much as look at me, I'll kill you.

The problem facing the wide scope theory is that it has to ascribe properties to NPI forms like *so much as* or Dutch *zelfs maar* which seem to be in conflict with each other. On the one hand, being NPIs, these items have to

appear in the scope of an NPI trigger in the surface syntactic structure, but on the other hand they must take scope over it in the semantics. As far as I know, this combination of properties would make them unlike all other NPIs, which have to appear in the scope of their trigger both syntactically and semantically. Note that it would also set them apart from positive polarity items such as *some* which necessarily take scope over negation, but which unlike *so much as*, *zelfs maar*, etc. do not need an NPI trigger to be grammatical. I conjecture that lexical items of the kind hypothesized by the wide scope theory—that is, items which need to be in the syntactic scope of a certain type of element, but at the same time have to take scope over that element semantically—probably do not exist in natural language.

6. Rooth's counterexample to the scope theory

At first glance it might seem that it should be rather easy to devise an empirical test to decide directly between the scope theory and the NPI theory. Formulated abstractly, such a test would involve a pair of sentences of the following form:

- (37) a. [... [L [A *even* [B [F]]]]]
 b. [... *even* [L [A [B [F]]]]]

Here L is some NPI licenser such as negation and F is the focused constituent that is associated with *even*. According to the wide scope theory, (37a) (on one of its readings) should be equivalent to (37b). In (37a) *even* is in the scope of negation, but at LF *even* should be raised to a position where it c-commands L, so that the LFs of (37a) and (37b) are the same. The NPI theory however predicts that (37a) and (37b) will generally differ in meaning. As we saw above, for the simple case where L is negation and there is no lexical material between L and B, the meaning of the two sentences comes out the same (assuming that negation does invert the relevant scale). But when L is an NPI licenser with more descriptive content, such as a negative predicate, or there is lexical material between L and B, we expect detectable differences in the presuppositions generated by *even*, since for (37a) the alternatives will be propositions of the form [B X], whereas for (37b) they will have the form L [A [B X]].

The clearest cases where differences in meaning between (37a) and (37b) can be observed involve relative clauses. Consider the following examples (for (a) we again focus on the reading in which *Syntactic Structures* is a book people are relatively likely to have read compared to contextually salient alternatives, say other books by Chomsky):

- (38) a. I know few people who even read [_F *Syntactic Structures*].
 b. I even know few people who read [_F *Syntactic Structures*].

The presupposition of (b) on either theory is as follows:

- (39) i. There is a book x ($x \neq$ *Syntactic Structures*) such that I know few people who read x .
 ii. For all books x ($x \neq$ *Syntactic Structures*) it is less likely that I know few people who read *Syntactic Structures* than that I know few people who read x .

According to the scope theory, the presupposition of (38a) will be the same as that of (38b). Determining the presupposition that (38a) has according to the NPI theory is a more complicated matter, because *even* occurs inside a relative clause that is headed by a quantificational NP, which raises the problem of presupposition projection in quantificational contexts (cf. Heim, 1983; Beaver, 1994). I will sidestep this issue here by just giving the presupposition as it is generated inside the relative clause, with the variable y (to be bound by *few people*) standing for the subject of the relative clause:

- (40) i. There is a book x ($x \neq$ *Syntactic Structures*) such that y did not read x .
 ii. For all books x ($x \neq$ *Syntactic Structures*) it is more likely that y read *Syntactic Structures* than that y read x .

Intuitively there is indeed a difference in meaning between the two sentences, although it is not easy to pin down exactly what it consists of. The reason for this is that although (38a) and (b) involve different scales, these scales are related in the following way. If it is more likely that people read *Syntactic Structures* than some other book x , then it will normally be less likely that I know few people who read *Syntactic Structures* than that I know few people who read x . Of course, this is not a logical entailment, but only a pragmatic one, which can be overridden by additional information. Nevertheless, the close relationship between the two scales makes it hard to intuitively distinguish the presupposition of (38a) from that of (b).

In other cases it turns out to be even more difficult to find any clear intuitive differences in presupposition between sentences instantiating the two schemata in (37). Rooth (1985) tries to base an argument against the wide scope theory on a case of this kind. He observes that (41) does not presuppose that there is a book x in addition to *Syntactic Structures* such that the

copyright committee kept John from reading *x*; this is shown by the felicity of the discourse in (42):

- (41) The copyright committee kept John from even reading [_F *Syntactic Structures*].
- (42) Because they had been stolen from the library, John couldn't read *The Logical Structure of Linguistic Theory* or *Cartesian Linguistics*. Because it was always checked out, he didn't read *Current Issues in Linguistic Theory*. The copyright committee kept John from even reading [_F *Syntactic Structures*].

What (41) does seem to presuppose is merely that there is a book other than *Syntactic Structures* which John did not read, which is the existential presupposition predicted by the NPI theory (assuming that the matrix verb *keep from* is a 'hole' for presupposition projection). In addition to these contrasts in the existential presupposition, the two theories predict different scalar presuppositions. According to the scope theory, (41) presupposes that the copyright committee is more likely to ban *Syntactic Structures* than any other contextually relevant book, whereas the NPI theory predicts the presupposition that John is more likely to read *Syntactic Structures* than any other contextually relevant book.

Wilkinson (1996) tries to explain away Rooth's (1985) counterexample to the scope theory by claiming that in (41) there is a focus on the matrix subject *the copyright committee* which is not associated with *even*, but which "carries an existential implicature that is introduced into the existential and scalar implicatures" (p. 202). The existential and scalar presuppositions predicted on the wide scope theory then come out as "There is something other than *Syntactic Structures* that John was kept from reading (by someone)" and "*Syntactic Structures* is the least likely thing for someone to keep John from reading". It is somewhat unclear why a free focus would have precisely this effect, but more importantly, the predicted presupposition is still not quite correct. (41) can be used felicitously even if there is nobody that keeps John from reading any other book than *Syntactic Structures*:

- (43) For his candidacy exam John had to read at least one classic work by Chomsky. He is very lazy however, and refuses to read any book that has more than a hundred pages. For that reason he did not want to read *The Logical Structure of Linguistic Theory*, *Aspects of the Theory of Syntax* or *Lectures on Government and Binding*. The censorship committee kept him from even reading [_F *Syntactic Structures*].

To account for this case Wilkinson (1996) would have to claim that the main verb *kept from* also carries a free focus which certainly is not reflected in the intonation of the sentence. In this example the context makes it very clear that the scale invoked by *even* only concerns the likelihood of John reading certain of Chomsky's books (with *Syntactic Structures* being the most likely, because it is the shortest) and not the likelihood of any book being banned by the censorship committee or anyone else.

There is a problem with Rooth's (1985) argument however which makes it hard to assess its value. Consider the corresponding sentence with *even* in the main clause:

- (44) The censorship committee even kept John from reading [_F *Syntactic Structures*]

On either theory we would expect the presupposition of this sentence to involve propositions of the form "the censorship committee kept John from reading *x*." Although the sentence certainly has such a reading, it is not clear that it could not be used in contexts such as (42) or (43), where the presupposition involves propositions of the form "John read *x*". That is, it seems that even if *even* has syntactic scope in the matrix clause its semantic scope may appear to include only the embedded clause. Maybe a mechanism like the one proposed by Wilkinson for cancelling out part of the material in the scope of *even* is needed after all. If this is the case it would considerably weaken the force of Rooth's argument, although of course it would not constitute an argument for the scope theory.

Another factor that may make it difficult to detect any clear difference in meaning between sentences of the form (37a) and (b) is that it is not clear what determines the ordering of the relevant scales. Following Karttunen and Peters (1979), Rooth (1985) and Wilkinson (1996), we have so far assumed that the scales invoked by *even* are based on likelihood, but as mentioned in section 4, this is not uncontroversial. In fact, it is not very hard to construct examples where likelihood does not appear to be relevant for the use of *even*:

- (45) John is a political non-conformist. He even read *Manufacturing Consent* although it has been banned by the censorship committee.

Here *Manufacturing Consent* need not be a particularly unlikely book for John to read. Because of his political views he may be even drawn to controversial or censored books. Rather, the relevant scale on which *Manufacturing Consent* occupies the topmost position could be one that ranks books according to the degree to which they reflect non-conformist thinking or their suitability for banning. Kay (1990) makes a similar point with the following dialogue:

- (46) A: It looks as if Mary is doing well at Consolidated Widget. George [the second vice president] likes her work.
B: That's nothing. Even Bill [the president] likes her work.

As Kay points out, for this example to be felicitous nothing needs to be presupposed about the relative likelihood of George and Bill liking Mary's work. What justifies the use of *even* here according to Kay is that "Bill's liking Mary's work is construable as evidencing a higher level of success at Consolidated Widget than merely George's liking her work" (p. 84). The inherent context dependency underlying the scales presupposed by *even* makes it considerably more difficult, if not impossible, to perceive any clear-cut contrasts in presupposition between sentences of the form (37a) and (b). If in (41) for instance, we take the propositions of the form "John read *x*" to be ordered according to how objectionable they are for the censorship committee rather than according to likelihood, this may make the sentence essentially equivalent to (44).

The upshot of this discussion is that in practice it may turn out to be a lot harder to construct a case deciding between the scope theory and the NPI theory than either Rooth (1985) or Wilkinson (1996) suggest, because the actual presupposition of *even* is less determinate than its classic formalization in the hands of Karttunen and Peters (1979). This does not mean, of course, that there is no way of choosing between the two theories, but only that it is harder to come up with a watertight empirical argument.

7. The status of the existential presupposition

Wilkinson's main argument against the scope theory is based on an example in which *even* occurs in the complement of a predicate which is both an NPI licenser and factive, namely *be sorry*:

(47) I am sorry I even [_F opened] the book.

Suppose that the contextually salient alternatives to the focused verb *opened* are other things one could have done with the book, such as reading it, memorizing it and writing a review about it. Now as Wilkinson (1996) points out, even if I did all of these things with the book, I could still felicitously utter (47). The NPI theory however predicts that at least one proposition of the form “I *X*’ed the book” (where *X* is a contextually salient action other than opening) should be true. Wilkinson concludes that this disproves the NPI theory. However, in light of the problems facing the scope theory outlined in section 5 it seems worthwhile to consider alternative explanations for her observation. Moreover, the scope theory doesn’t seem to make the right prediction about (47) either, because it entails that the existential presupposition for (47) should be that there is at least one contextually salient action *X* (other than opening) such that “I am sorry I *X*’ed the book” is true. But observe that (47) can be used just as felicitously in a situation in which the only thing I did with the book was to open it. Since “I am sorry I *X*’ed the book” presupposes “I *X*’ed the book” the wide scope theory predicts that “I *X*’ed the book” is true for at least one value of *X* other than opening.

In trying to come up with an alternative explanation for Wilkinson’s observation which saves the NPI theory one could take either of two routes. The first is to claim that NPI *even* does generate an existential presupposition in the embedded clause, but that it somehow fails to get projected to the matrix level. This idea is not very promising however, because factive predicates behave as ‘holes’ for presupposition projection (Karttunen, 1974). For instance, the matrix sentence of (48) presupposes that I invited someone in addition to Bill:

(48) I am sorry I invited [_F Bill] too.

Now presupposition projection is still very much a mysterious phenomenon, so it might be that some reason can be found why it fails in the case of (47). At this point however it is hard to see why this should be so. I will therefore pursue the second route by which we can try to make the NPI theory compatible with Wilkinson’s (1996) observation. This is to claim that in (47) no existential presupposition is generated in the first place. As I mentioned in section 4, not all researchers agree that *even* carries an existential presupposition. Krifka (1991) and von Stechow (1991) cite data such as (49) where the existential presupposition would contradict the assertion made by the sentence:

(49) Bill even danced only with [_F Sue].

Von Stechow suggests that the existential presupposition either is not part of the meaning of *even* at all or can get cancelled in cases like (49). The problem for either explanation is that in other cases there is a clear intuition that *even* does carry an existential presupposition which is immune to cancellation, even by explicit means. Thus the following are felt to be contradictory:

- (50) a. We even invited [_F Bill], although we didn't invite anyone else.
b. We didn't even invite [_F Bill], but we invited everyone else.
- (51) a. I even assigned [_F *Syntactic Structures*] to the students, but they didn't have to read anything else.
b. I didn't even assign [_F *Syntactic Structures*] to the students, although they did have to read all other books by Chomsky.
- (52) a. John even drank [_F beer], but that was the only thing he drank.
b. John didn't even drink [_F beer], but that was the only thing he didn't drink.

Such examples show that the alleged existential presupposition cannot be rediagnosed as a mere conversational implicature, because the hallmark of conversational implicatures is their cancellability by explicit contradiction:

(53) John invited some students. In fact, he invited all of them.

So assuming the NPI theory, how can we explain the absence of an existential presupposition in (47)? I want to argue that the existential presupposition that is usually associated with *even* does not have independent status, but instead arises indirectly as a pragmatic entailment of the scalar presupposition of *even* combined with the assertion expressed by the sentence in which *even* occurs, given some further plausible assumptions about the use of *even*. Consider a simple case like (54):

(54) Mary even invited [_F Bill].

Suppose that the contextually salient alternative propositions are the following:

(55) {Mary invited John, Mary invited Sue, Mary invited Bill, Mary invited Jane}.

For the sake of argument let us for the moment assume the strongest version of the scalar presupposition, which says that of all the propositions in (55) “Mary invited Bill” is the least likely. Thus, the speaker of (54) asserts that Mary invited Bill and presupposes that this proposition is the least likely of all alternative propositions. Now on the basis of this, the speaker will most certainly be inclined to conclude that all the more likely propositions in the set of alternatives will also be true, on the basis of the default assumption that if p is less likely than q and p is true, then (in all likelihood) q is also true. It should be noted though that this can not be the whole story. In our everyday experience we are all too familiar with the fact that a proposition that is *prima facie* unlikely may turn out to be true while a far more likely alternative proposition is in fact false. I propose therefore that there is another aspect to the meaning of *even* which serves to license the (apparent) existential presupposition. *Even* can only be used if the speaker intends the hearer to draw a scalar inference. This condition on the use of *even* can be thought of as a conventional but non-truthconditional aspect of its meaning, in much the same way that part of the conventional meaning of *but* is to draw a contrast between the two conjuncts. Thus, the fact that the speaker uses *even* in (54) not only presupposes that the asserted proposition “Mary invited Bill” is the least likely of the alternative propositions, but also justifies the hearer in drawing the conclusion that the other (more likely) propositions in the set of alternatives are also true. In this way what used to be called the existential presupposition can be derived from the combination of the assertion and the scalar presupposition. (Note that this only follows if the set of alternatives contains at least one member in addition to the asserted proposition. If necessary we can regard this as an additional condition on the use of *even*.)

As I discussed in section 4, there is widespread disagreement about the strength and nature of the scalar presupposition. However, the indirect account of the existential presupposition I have just sketched holds for other versions as well. The weakest possible variant of the scalar presupposition is that there is at least one alternative proposition that is more likely than the asserted proposition. The hearer will therefore still be justified in concluding that at least one of the alternative propositions is true. The account also does not depend on the assumption that likelihood is the ordering relationship underlying the scalar presupposition. If instead we assume that the relevant ordering is one of pragmatic entailment (Fauconnier, 1975a,b; Kay, 1990), we may not even need a special condition on the use of *even* to derive the existential presupposition, because by the very nature of the scalar presupposition the asserted proposition will always pragmatically entail at least one alternative proposition. I will leave these issues aside however, and

continue to assume Karttunen and Peters' (1979) version of the scalar presupposition.

With NPI *even*, the existential presupposition can be derived from the scalar presupposition in essentially the same way, at least in most cases. First consider (56), assuming the same set of alternatives (55):

(56) Mary didn't even invite [_F Bill].

The scalar presupposition of NPI *even* is that "Mary invited Bill" is the most likely of all alternatives. Since (56) asserts that Mary did not invite Bill, the hearer may conclude that all less likely alternative propositions are false too, again assuming that by using *even* the speaker explicitly intends the hearer to draw scalar inferences.

It is now easy to see why no existential presupposition arises in the case of (47), repeated here as (57):

(57) I am sorry I even [_F opened] the book.

Suppose the alternative propositions are the following:

(58) {I opened the book, I read the book, I photocopied the book, I memorized the book}.

According to the scalar presupposition, "I opened the book" is the most likely alternative. However, (57) does not entail that "I opened the book" is false. To the contrary, due to the factive nature of the predicate *be sorry* the sentence presupposes that "I opened the book" is true. But from the fact that a proposition *p* is true we cannot conclude anything about propositions that are less likely than *p*. Therefore, from the truth of "I opened the book" we cannot draw any conclusions about the truth of other propositions of the form "I *X*'ed the book". We can thus explain the absence of the existential presupposition in (57) from the fact that the proposition expressed by the complement clause is at the same time presupposed to be true (due to the factivity of *be sorry*) and more likely than all alternative propositions (due to the scalar presupposition of NPI *even*).

Interestingly, the indirect account predicts that no existential presupposition will arise as well in other cases which are not discussed by Wilkinson (1996):

(59) Only John has even [_F opened] the book.

Assuming Horn's (1969) classical analysis of *only* according to which *Only Muriel voted for Hubert* presupposes that Muriel voted for Hubert and asserts that no one else did, (59) presupposes that John opened the book. Since "John opened the book" again is the most likely alternative due to the scalar presupposition of NPI *even*, no conclusions can be drawn about the truth or falsity of the other alternatives. This is in accordance with the fact that (59) can be used felicitously and truthfully in a situation where John actually did perform all contextually salient alternative actions with the book.

To complete the account, two more questions have to be answered. I claim that by using *even* the speaker intends the hearer to draw a scalar inference. But what is this scalar inference in the case of (57)? I assume that here the scalar inference does not simply involve propositions of the form "I *X*'ed the book", but rather propositions of the form "I am sorry I *X*'ed the book". Since (57) asserts that I am sorry I opened the book, it entails that for any action *X* that requires opening the book (such as reading it), if I *X*'ed the book, I am sorry I *X*'ed the book. Thus, the scalar inference that the speaker intends the hearer to draw by using *even* does not always need to be an entailment among the set of alternative propositions associated with *even*, although usually (and maybe even by default) it is. The other question that still needs to be addressed is how the proposed analysis deals with examples such as (49) for which von Stechow (1991) suggested a cancellation account, because the existential presupposition would contradict the assertion made by the sentence. Let us first consider a simpler case of this kind, which I already mentioned in section 4:

- (60) A: Is Claire an [_F assistant] professor?
 B: No, she's even an [_F associate] professor.

Here the alternatives (assistant, associate, and full professor) are mutually exclusive, and hence there is no entailment relation between them, not even a pragmatic one. As a result, neither "Claire is an associate professor" nor "Claire is a full professor" can be inferred from the asserted proposition "Claire is an associate professor" in combination with the scalar presupposition of the sentence. Notice that since the existential presupposition does not arise in the first place, no cancellation takes place. The same analysis applies to (49). Here the alternatives are such mutually exclusive propositions as:

- (61) {Bill danced only with Sue, Bill danced only with Mary, Bill danced only with Pat, Bill danced only with Melissa}.

Because there is no relation of (pragmatic) entailment between the alternative propositions, the existential presupposition again does not arise.

8. Conclusion

A common theme running through this paper has been how the choice between the scope theory and the NPI theory is affected by one's assumptions about the presupposition introduced by *even*. The particular formulation of this presupposition assumed by both Rooth (1985) and Wilkinson (1996) (that of Karttunen and Peters, 1979) is problematic in a number of respects. By arguing that the existential presupposition of *even* can be derived indirectly from the scalar presupposition, I have been able to give an alternative account of Wilkinson's (1996) crucial counterexample to the NPI theory. On the other hand, due to the vagueness and context dependency of the scales presupposed by *even*, it turns out that Rooth's (1985) counterargument to the scope theory is not very strong either. However, considerations concerning general restrictions on scope and the existence of non-homophonous NPI counterparts of *even* in languages other than English provide decisive arguments against the scope theory.

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