

Focus Particles and Embedded Exhaustification*

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Abstract

The focus particle *even* gives rise to an inference that the sentence in which it occurs denotes a proposition that is ranked above the relevant alternatives on a salient pragmatic scale. As a consequence, if unembedded *even* associates with a strong element that is in a scale-reversing environment, the sentence will be infelicitous. We present data that appear to contradict this generalization, i.e. felicitous sentences where *even* associates with a strong element across a single scale-reversing operator. We show that the appearance of contradiction disappears on the assumption of embedded exhaustification (e.g. Chierchia et al. 2011). We conclude by observing an analogous puzzle with another focus particle, *only*, which is resolved on the same assumption.

1 A puzzle about *even*

The focus particle *even* occurs only in sentences whose meaning is relatively high on a salient pragmatic scale. If *even* is analyzed as adjoined at a clausal level at LF, this is derived by assigning it a scalar presupposition that the meaning of its sister, the so-called prejacent of *even*, is less likely or more noteworthy than the relevant focus alternatives to

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its sister (cf. Karttunen & Peters 1979, Rooth 1985, Herburger 2000, among others). The presupposition is represented in (1) where C is a set of relevant focus alternatives, p is the prejacent of *even*, and $p \prec_c q$ stands for p being less likely or more noteworthy than q in the context c .

(1) $\llbracket \text{even} \rrbracket^{g,c}(C, p, w)$ is defined only if $\forall q \in C [p \neq q \rightarrow p \prec_c q]$.

For example, the sentence in (2a) has the structure in (2b) where *even* associates with the strong scalar item *all* in its immediate scope, whose capitalization in (2a) indicates focal stress. The sentence is felicitous because the prejacent of *even* – that John read all of the books – is less likely or more noteworthy than the relevant focus alternative that John read some of the books (2c).

- (2) a. John even read ALL of the books.
 b. $\llbracket \text{even } C_1 \rrbracket$ [**John read all_F of the books**]
 c. $\llbracket (2b) \rrbracket^{g,c}$ is defined only if $\forall q \in \{\text{that John read some of the books, that John read all of the books}\}$: $q \neq \text{that John read all of the books} \rightarrow \text{that John read all of the books} \prec_c q$ iff that John read all of the books \prec_c that John read some of the books. (✓ in plausible contexts)

The comparison of likelihood or noteworthiness evoked by *even* respects entailment: if a proposition p entails a proposition q , then q cannot be less likely or more noteworthy than p . One consequence of this is that if *even* associates with a weak element like *one*, an appropriate operator must intervene between *even* and its associate for the sentence to be felicitous (see Heim 1984, Krifka 1995, Lahiri 1998 for discussion of this fact in relation to negative polarity items). By way of illustration, a sentence in which *even* associates with *one* in the absence of an appropriate intervening operator is infelicitous:

(3) #John read even ONE book.

The scalar presupposition triggered by *even* in (3) is that John reading one book is less likely or more noteworthy than, say, John reading two books (4). This presupposition is unsatisfiable: since John reading one book is entailed by John reading two books, the former cannot be less likely or more noteworthy than the latter.

- (4) $\llbracket [\text{even } C_1] [\text{John read one}_F \text{ book}] \rrbracket^{g,c}$ is defined only if for all $n > 1$: that John read one book \prec_c that John read n books. (# in all contexts)

However, if there is a scale-reversing operator that intervenes between *even* and its weak associate, the sentence may be felicitous. This is exemplified in (5) where *even* associates with occurrences of *one* that are embedded in the antecedent clause of a conditional and the restrictor of a plural definite description.

- (5) a. Even if John read ONE book, he will pass the exam.
 b. Even the students who read ONE book passed the exam.

Since in these cases the prejacent of *even* (Strawson) entails the alternatives¹ – e.g. that if John read one book he will pass the exam entails that if he read two or more books he will

¹A proposition p Strawson entails a proposition q if it holds that p together with the assumption that q is defined entails q . A recursive definition of cross-categorial Strawson entailment is in (i) (Gajewski 2011).

- (i) Cross-categorial Strawson entailment (\Rightarrow_S)
 a. For p, q of type t : $p \Rightarrow_S q$ iff p is false or q is true.
 b. For f, g of type $\langle \sigma, \tau \rangle$: $f \Rightarrow_S g$ iff for all x of type σ such that $g(x)$ is defined: $f(x) \Rightarrow_S g(x)$.

Plural definite descriptions and conditionals are Strawson downward-entailing in their restrictor and antecedent clause, respectively (von Stechow 1999; cf. Lahiri 1998 for plural definite descriptions). More specifically, the arguments in (ii) and (iii) are intuitively valid: on the assumption that the conclusion is defined, (iib)-(iiib), an inference from supersets to subsets is licensed in the restrictor of a plural definite description (ii) and the antecedent clause of a conditional (iii) (see von Stechow 1999 for extensive discussion).

- (ii) a. The students who read one book passed the exam.
 ($\approx \forall x \in D[x \text{ is a student who read one book} \rightarrow x \text{ passed the exam}]$)
 b. There are students who read two or more books.
 c. $\{x: x \text{ is a student who read two or more books}\} \subseteq \{x: x \text{ is a student who read one book}\}$
 d. \therefore The students who read two or more books passed the exam.
 ($\approx \forall x \in D[x \text{ is a student who read two or more books} \rightarrow x \text{ passed the exam}]$)

pass the exam –, the prejacent may be less likely or more noteworthy than the alternatives, esp. in contexts in which the expectation is that the more you read, the better you do in exams (6). Seeing that we plausibly share this expectation, the sentences are perceived as felicitous.

- (6) a. $[[\text{even } C_1] [\text{if John read one}_F \text{ book he will pass the exam}]]^{g,c}$ is defined only if for all $n > 1$: that if John read one book he will pass the exam \prec_c that if John read n books he will pass the exam. (\checkmark in plausible contexts)
- b. $[[\text{even } C_1] [\text{the student who read one}_F \text{ book passed the exam}]]^{g,c}$ is defined only if for all $n > 1$: that the students who read one book passed the exam \prec_c that the students who read n books passed the exam. (\checkmark in plausible contexts)

Another consequence of the fact that the likelihood or noteworthiness comparison evoked by *even* respects entailment is that if *even* associates with a strong element like *all*, a scale-reversing operator may not intervene between *even* and its associate by itself (7). This is because if a strong element like *all* is in the immediate scope of a scale-reversing operator, the minimal clause containing the operator will be entailed by its alternatives in which the strong element is replaced by a weaker alternative and thus cannot be less

The semantics of the plural definite description in (ii) effectively involves universal quantification where the noun phrase determines the domain of the universal quantifier. In addition, the construction triggers an existence presupposition: the restrictor is not empty. The semantics of the conditional in (iii) is analogous.

- (iii) a. If John read one book he will pass the exam.
 ($\approx \forall w \in \text{Acc}[\text{John read one book in } w \rightarrow \text{John will pass the exam in } w]$)
- b. It is possible that John read two or more books.
- c. $\{w: \text{John read two or more books in } w\} \subseteq \{w: \text{John read one book in } w\}$
- d. \therefore If John read two or more books he will pass the exam.
 ($\approx \forall w \in \text{Acc}[\text{John read two or more books in } w \rightarrow \text{John will pass the exam in } w]$)

Although arguments have been put forward that the restrictor of a plural definite description and the antecedent clause of a conditional are not Strawson downward-entailing environments, we are in agreement with von Stechow (1999) that they are in fact inconsequential for the evaluation of downward-entailingness (see Schlenker 2004 for an overview; footnote 3 contains some further discussion). We conflate the notions of entailment and Strawson entailment in the following (see footnote 2) and continue to refer to (Strawson) downward-entailing operators and environments as scale-reversing operators and environments.

likely or more noteworthy than them.

(7) **A prediction of the standard approach to *even***

If *even* associates with a strong element across a single operator at LF and this operator is scale-reversing, the scalar presupposition of *even* is unsatisfiable.

This paper is concerned with data that appear to be in conflict with the prediction in (7). Specifically, we focus on the sentences in (8) where *even* associates with a strong scalar item *all* that is embedded in an antecedent clause of a conditional, a plural definite description and a restrictor of a universal quantifier, three scale-reversing environments. The sentences in (8a)-(8b) are universally judged as felicitous, while the sentence in (8c) is judged as felicitous by some though not all speakers (% stands for cross-speaker variation).

- (8) a. Even if John read ALL of the books, he will fail the exam.
b. Even the students who read ALL of the books failed the exam.
c. %Even every student who read ALL of the books failed the exam.

In light of the preceding discussion, the felicity of the sentences in (8) is perplexing. For example, if the sentence in (8a) has the structure in (9a), it holds that *even* associates with the strong scalar item *all* across a single scale-reversing operator and, according to (7), its scalar presupposition should be unsatisfiable.

- (9) a. [even C₁] [if John read all_F of the books he will fail the exam]
b. [[(9a)]^{g,c} is defined only if that if John read all of the books he will fail the exam
 \prec_c that if John read some of the books he will fail the exam. (# in all contexts)

Namely, if it holds that if John read some of the books he will fail the exam, then it holds *ipso facto* that if John read all of the books he will fail the exam. But then the scalar presup-

position triggered by *even*, which requires the latter proposition to be less likely or more noteworthy than the former (9b), cannot be correct: a prejacent cannot be less likely or more noteworthy than the alternatives that entail it.² The same considerations apply to (8b)-(8c). Since the sentences in (8a)-(8b) are universally acceptable and (8c) is acceptable for at least some speakers, something is amiss with the *prima facie* plausible analysis in (9).

If the main predicate *fail the exam* is replaced with *pass the exam* in (8), the sentences become infelicitous for all speakers, as is shown in (10). On the face of it, this infelicity fits the expectations described above better than the data in (8).

- (10) a. #Even if John read ALL of the books, he will pass the exam.
b. #Even the students who read ALL of the books passed the exam.
c. #Even every student who read ALL of the books passed the exam.

The goals of this paper are, first, to show that the tension between the prediction in (7) and the data in (8) is only apparent and, second, to explain why this appearance does not extend to (10). We achieve these goals by employing the grammatical device of covert exhaustification (cf. Krifka 1995, Landman 1998, Fox 2007, among others). In particular, we show that exhaustifying the *if*-clause and the restrictors rescues the inferences triggered by *even* in (8), while this is not the case in (10).³ The paper has the following structure:

²An objection to this reasoning might be that because the relation between the propositions at hand is not that of entailment but rather that of Strawson entailment (see footnote 1), nothing is predicted about their relative likelihood or noteworthiness. However, this objection does not bear scrutiny: The likelihood or noteworthiness evoked by *even* is arguably conditioned on the beliefs of the speaker or on some other subset of the context set; let us call this set E. Since in our examples the presuppositions of the prejacent of *even* are inherited by the matrix sentence, they need to be satisfied in the context set and consequently in E. This means that the prejacent as well as all the alternatives are defined on E (recall that in our examples the presuppositions of the prejacent entail the presuppositions of the alternatives) and, moreover, each alternative conjoined with E entails the prejacent conjoined with E. Thus, the prejacent cannot be less likely or more noteworthy than the alternatives given E.

³Some approaches to definite descriptions and conditionals assign them a non-monotone semantics (e.g. Schlenker 2004). We submit that although these approaches might find some support in the data in (8a)-(8b) – on a non-monotone semantics of definite descriptions and conditionals, these sentences comply with the prediction in (7) –, they fail to account for the contrast between (8) and (10) without further ado (see also footnote 1). For illustration, the definite determiner has been analyzed as denoting a choice function that

Section 2 introduces covert exhaustification and accounts for the above data. Section 3 discusses three issues raised by the analysis. The first issue pertains to the recently proposed economy condition on the distribution of covert exhaustification (Fox & Spector 2009). The second issue concerns the variation among scale-reversing operators with respect to whether unembedded *even* can felicitously associate with a strong element in their scope. The final issue pertains to a contrast between covert and overt exhaustification with *only*. Section 4 presents another focus particle whose distribution can be properly explained only by relying on covert exhaustification – the exclusive particle *only*. Section 5 points to some avenues for future research and concludes.

2 A resolution of the puzzle

2.1 Covert exhaustivity operator and its embedding

A fundamental question in the semantics/pragmatics interface is whether scalar implicatures, exemplified in (11), are computed in pragmatics or in grammar. The pragmatic approach argues that scalar implicatures are generated by an extra-grammatical process that involves abductive reasoning about speakers' beliefs and intentions (Grice 1975, Sauerland 2004, Geurts 2011, among others), while the grammatical approach assumes that there exists a covert exhaustivity operator *exh* in grammar that associates with scalar items (Fox 2007, Chierchia et al. 2011).

selects a plurality of salient individuals from the set denoted by the nominal complement of the determiner (cf. Schlenker 2004). If in (8b) the choice function denoted by *the* selects the plurality of students who read some but not all of the books when applied to a set of students who read some of the books, the scalar presupposition of the sentence may well be satisfied – the alternative that the students who read some (but not all) of the books failed the exam is more likely than the prejacent of *even* that the students who read all of the books failed the exam (see section 2). On some other resolutions of the definite description, the scalar presupposition is implausible, e.g. if the choice function selects the plurality of students who read some or all of the books when applied to a set of students who read some of the books. However, a similar state of affairs obtains for (10b): if the choice function denoted by *the* selects from any set of students, say, the students in that set that are most likely to pass the exam, perhaps the smartest students, the scalar presupposition of (10b) may well be satisfied too, esp. if it is possible that some of the most likely students to pass the exam read some but not all of the books. The fact that the sentence in (10b) is infelicitous is thus *ceteris paribus* unexpected on the choice function approach to definite descriptions.

(11) John read some of the books. (\rightsquigarrow John read some but not all of the books.)

According to the grammatical approach, the covert exhaustivity operator *exh* adjoins at a clausal level and has the semantics in (12): it takes a domain of alternatives and a prejacent as its arguments and returns the proposition that the prejacent is true and that all the alternatives that are not entailed by the prejacent are false (see Fox 2007 for a possible modification).

(12) $\llbracket \mathbf{exh} \rrbracket^{g,c}(C, p, w) = 1$ iff $p(w) = 1$ and $\forall q \in C[p \not\subseteq q \rightarrow q(w) = 0]$.

The approach assigns the sentence in (11) the structure in (13a). The domain of *exh* is determined by the scalar items that occur in its scope: in (13a) the scalar item is *some*, which has *all* as an alternative, and so the domain of *exh* contains the propositions that John read some of the books and that John read all of the books. The semantic contribution of *exh* is the inference that the latter alternative, which asymmetrically entails the former, is false – i.e. that John read some but not all of the books.

- (13) a. **[exh C₁] [John read some of the books]**
b. $\llbracket (13a) \rrbracket^{g,c}(w) = 1$ iff John read some of the books in *w* and John did not read all of the books in *w*.

Similarly to *only* and other alternative-sensitive operators, *exh* is syntactically embeddable (e.g. Fox 2007, Chierchia et al. 2011). In particular, it can be embedded in the antecedent clause of a conditional and the restrictor of a plural definite description and *every*. We argue that this is the case in the sentences in (8): the insertion of *exh* in the embedded clause allows the scalar presupposition triggered by *even* to be satisfied.

2.2 Embedded exhaustification resolves the puzzle

The source of the pathology in the analysis sketched in (9) was that all the alternatives in the domain of *even* entailed the prejacent, causing the scalar presupposition of *even* to be unsatisfiable. Only if the relevant alternatives in the domain of *even* do not entail the prejacent can the scalar presupposition be correct. This can be achieved in the case of (8) by inserting *exh* that associates with the focused scalar item in the *if*-clause, in the plural definite description and in the restrictor of *every*, respectively – that is, by parsing the sentences in (8) as in (14) (see Heim & Kratzer 1998, chapter 5, for the interpretation of relative clauses).

- (14) a. [even C₂] [if [exh C₀] [John read all_F of the books] he will fail the exam]
b. [even C₃] [the students [1 [exh C₀] [t₁ read all_F of the books]] failed the exam]
c. [even C₄] [everyone [1 [exh C₀] [t₁ read all_F of the books]] failed the exam]

The embedded exhaustification in (14) does not have an effect on the prejacent of *even*: since the embedded clauses denote propositions that entail their alternatives, e.g. that John read all of the books entails that John read some of the books, none of the alternatives is excluded by exhaustification. However, the presence of *exh* does have an effect on the alternatives to the sister of *even* and thus its domain of quantification (we assume that *exh* can pass on the alternatives induced in its scope, see footnote 7 for discussion). This is because the alternatives to the sister of *even* are built from the propositions that John read some of the books and that $g(\mathbf{t}_1)$ read some of the books, respectively ($g(\mathbf{t}_1)$ is the assignment-dependent meaning of the subject trace in the relative clause). And exhaustification of these propositions given the respective alternatives is not vacuous: it yields the propositions that John read some but not all of the books and that $g(\mathbf{t}_1)$ read some but not all of the books. As a result, the focus alternatives to the sister of *even* in

(14) are, respectively, the propositions (a) that if John read some but not all of the books he will fail the exam, (b) that the students who read some but not all of the books failed the exam, and (c) that everyone who read some but not all of the books failed the exam. These alternatives neither entail nor are entailed by the respective prejacent (a) that if John read all of the books he will fail the exam, (b) that the students who read all of the books failed the exam, and (c) that everyone who read all of the books failed the exam. This means that *even* quantifies over logically independent alternatives in (14), given in (15).

- (15)
- a. $g(C_2) = \{\text{that if John read all of the books he will fail the exam, that if John read some but not all of the books he will fail the exam}\}$
 - b. $g(C_3) = \{\text{that the students who read all of the books failed the exam, that the students who read some but not all of the books failed the exam}\}$
 - c. $g(C_4) = \{\text{that everyone who read all of the books failed the exam, that everyone who read some but not all of the books failed the exam}\}$

Since the alternatives in its domain are logically independent, the scalar presuppositions triggered by *even* in (14), computed in (16), are consistent: logically independent alternatives may stand in any likelihood or noteworthiness relation to each other. Moreover, the presuppositions are satisfied if it is expected that the more you read, the better you do in exams. Seeing that we plausibly share this expectation, the sentences in (8) should be felicitous: the scalar presuppositions triggered by *even* in these sentences are satisfied.

- (16)
- a. $\llbracket(14a)\rrbracket^{g,c}$ is defined only if that if John read all of the books he will fail the exam \prec_c that if John read some but not all of the books he will fail the exam.
(✓ in plausible contexts)
 - b. $\llbracket(14b)\rrbracket^{g,c}$ is defined only if that the students who read all of the books failed

the exam \prec_c that the students who read some but not all of the books failed the exam. (✓ in plausible contexts)

- c. $[[\text{(14c)}]]^{g,c}$ is defined only if that everyone who read all of the books failed the exam \prec_c that everyone who read some but not all of the books failed the exam. (✓ in plausible contexts)

Thus, the approach correctly predicts the conditional sentence in (8a) and the sentence with the plural definite description in (8b) to be acceptable; it also explains the judgments of the speakers who accept *even* associating with a strong element in the restrictor of *every* (8c) (see section 3.2 for discussion of cross-speaker variation with respect to this environment).

2.3 Scalar particles and existential presupposition

There is another parse of the sentences in (8) that has a consistent interpretation according to the above discussion – namely, a parse where *exh* is in the immediate scope of *even*:

- (17) a. [even C₂] [exh C₀] [if John read all_F of the books he will fail the exam]
 b. [even C₃] [exh C₀] [the boys who read all_F of the books failed the exam]
 c. [even C₄] [exh C₀] [everyone who read all_F of the books failed the exam]

On this parse, the sentence in (8a) would have the assertive meaning that if John read all of the books he will fail the exam but it is not the case that if he read some of the books he will fail the exam. Since the sentence does not convey this meaning but rather that no matter how many of the books he read John will fail the exam, the parse in (17a) should be ruled out. However, it is not ruled out on the grounds of a faulty scalar presupposition – it presupposes that the proposition that if John read all of the books but not if he read some of the books he will fail the exam is less likely than the alternative that if John read some of the books he will fail the exam. This presupposition is correct in contexts in which the

expectation is that the more you read, the better you do in exams – an expectation that we plausibly share. In particular, it is highly unexpected that John reading just some of the books will allow him to pass the exam and him reading all of the books will not. Similar considerations apply to the parses in (17b)-(17c).

In place of a faulty scalar presupposition, the source of the unavailability of the parses in (17) is another inference triggered by *even* – its existential presupposition (e.g. Karttunen & Peters 1979, Rooth 1985, Guerzoni 2003; Rullmann 1997 for dissenting view). This presupposition requires that at least one alternative in the domain of *even* that is not identical to the prejacent is true.

(18) $\llbracket \text{even} \rrbracket^{g,c}(C, p, w)$ is defined only if

- (i) $\forall q \in C[p \neq q \rightarrow p \prec_c q]$ and (scalar presupposition)
- (ii) $\exists q \in C[p \neq q \wedge q(w) = 1]$. (existential presupposition)

Since the alternatives in the domain of *even* in (17) are mutually exclusive, which is a consequence of *exh* being in the immediate scope of *even*, the existential presuppositions of *even* in (17) are inconsistent with the assertions of the sentences – e.g. it cannot both hold that if John read some of the books he will fail the exam (the existential presupposition) and that if he read all of the books but not if he read some of the books he will fail the exam (the assertion). This explains the unavailability of the parses in (17) and other parses where *exh* is in the immediate scope of *even* – they have inconsistent meanings.⁴

Furthermore, the existential presupposition triggered by *even* plays a role in deriving the right inferences for the sentences in (8). As we have observed above, the sentence (8a) conveys that John will fail no matter how many of the books he read. Although the

⁴If a parse of a sentence in (8) contains a more deeply embedded *exh* in addition to *exh* in the immediate scope of *even*, it is ruled out on the same grounds. Namely, the domain of *even* contains also on these construals only mutually exclusive alternatives (e.g. that only if John read only some of the books he will fail the exam is inconsistent with that only if John read all of the books he will fail the exam). Consequently, only one of the alternatives can be true, leading to a clash between the existential presupposition and the assertion.

assertive meaning of the structure in (14a), repeated below, does not secure this inference, the inference is predicted once the existential presupposition of the structure is taken into account – that if John read some but not all of the books he will fail the exam. Together, the assertive meaning and the existential presupposition entail that John will fail no matter how many of the books he read (20).⁵

- (19) a. Even if John read all of the books, he will fail the exam.
 b. **[even C₂] [if [exh C₀] [John read all_F of the books] he will fail the exam]**
- (20) a. Assertive meaning of (19b): if John read all of the books, he will fail the exam.
 b. Existential presupposition of (19b): if John read some but not all of the books, he will fail the exam.
 c. ⇒ No matter how many of the books John read, he will fail the exam.

Moreover, in contexts in which the scalar presupposition of the sentence is satisfied, i.e. in contexts in which the more you read, the better you do in exams, the sentence contextually entails that John will fail the exam whether or not he read any of the books.

The same reasoning applies to the other two sentences in (8). In particular, in the case of the sentence with a plural definite description (8b), repeated below, the existential presupposition triggered by *even* is that the students who read some but not all of the books failed the exam.

⁵If *some* has relevant alternatives in addition to *all*, say, *most*, the existential presupposition and the assertive meaning of (14a) will not secure the intuitive inference of the sentence that John will fail the exam no matter how many of the books he read. Instead, a weaker inference is secured: if John read all of the books he will fail the exam and either if he read some but not most of the books he will fail the exam or if he read most but not all of the books he will fail the exam. Now, the fact that the existential presupposition of *even* sometimes appears too weak is well-known and can be avoided if we assume that *even* triggers an additive presupposition that is universal rather than existential (cf. Lycan 1991, van Rooy 2003). In the case of (14a), the universal additive presupposition would be that if John read some but not most of the books and if he read most but not all of the books he will fail the exam. Together with the assertion, this presupposition would secure the intuitive inference that John will fail the exam no matter how many of the books he read. Although adopting universal additive presupposition would not affect any of the conclusions reached in the main text, we continue to employ the more conventional existential presupposition and a restricted set of alternatives for perspicuity.

- (21) a. Even the students who read ALL of the books failed the exam.
 b. [even C₃] [the students [1 [exh C₀] [t₁ read all_F of the books]] failed the exam]
 c. Existential presupposition of (21b): the students who read some but all of the books failed the exam.

Since plural definite descriptions give rise to the inference that their restrictor is not empty (see footnote 1), it follows from the existential presupposition in (21c) that there are boys who read some but not all of the books. And this prediction is indeed correct if the sentence is uttered out of the blue or, say, as a reply to the question *how was the exam*. However, in some discourses sentences like (21a) appear to give rise to slightly weaker existential inferences. We discuss this caveat in the following section.

2.4 Excursus: Breadth of focus

The discourse in (22) contains the sentence in (21a). A reviewer has observed that the discourse is felicitous, even though its first sentence indicates that it is not presupposed that there are students who read some but not all of the books.

- (22) I don't know whether there are students who read just some of the books, but in any case, even the students who read ALL of the books failed the exam.

This is problematic for our account to the extent that the second sentence of the discourse has the structure in (21b) where *even* associates with *all* and consequently triggers the existential presupposition in (21c). We argue in the following that a different parse of the sentence is available in (22).

It is well-known that accent placement and focus marking do not necessarily coincide (Selkirk 1995, Schwarzschild 1999, Wagner 2012, among others). Specifically, if appropriate linguistic material that corresponds to parts of a focused phrase is salient in the

discourse (given), a subconstituent of the focused phrase may be accented that could not be accented otherwise. This is illustrated in (23) and (24): the VPs in B's replies are focus marked in both discourses due to question-answer congruence. Accordingly, the default accent placement is on *him* and *John*, respectively. However, as John is mentioned in A's question in (23) and thus given, the accent can shift from the direct object to the verb. There is no mention of John in (24), leaving an accent shift unmotivated (see e.g. Schwarzschild 1999 for details).

(23) A: What did John_i's mother do?

B: She PRAISED him_i.

[she [PRAISED him_i]_F]

(24) A: What did Mary do?

B: #She PRAISED John.

[she [PRAISED John]_F]

We submit that givenness plays an important role in the discourse in (22): an antecedent in the first sentence – the constituent *read just some of the books* – motivates deaccentuation of some of the material in the focused phrase of the second sentence:

(25) a. Given material: **[read just some of the books]**

b. **[even C₁] [the students who [read ALL of the books]_F failed the exam]**

Although the pitch accent is on *all* in (22), this is compatible with focus marking on the VP or some bigger constituent. Accordingly, if *even* associates with *read all of the books*, its domain consists of alternatives built from the alternatives to this phrase and may thus be the set {that the students who read all of the books failed the exam, that the students who failed to read all of the books failed the exam}. The existential presupposition triggered by *even* is then that the alternative that the students who failed to read all of the books

failed the exam is true (26). This gives rise to the weak existential inference that there are students who read none or just some of the books, which is compatible with the import of the first sentence of the discourse in (22).

- (26) Existential presupposition of (25b): the students who failed to read all of the books failed the exam. (\Rightarrow There are students who did not read all of the books.)

Moreover, since the alternatives in the domain of *even* are logically independent, the sentence triggers a satisfiable scalar presupposition. Indeed, it is less likely or more noteworthy in plausible contexts that the students who read all of the books failed the exam than that the students who failed to read all of the books failed the exam (27). The discourse in (22) thus has a coherent interpretation if its second sentence is parsed as in (25).

- (27) Scalar presupposition of (25b): that the students who read all of the books failed the exam \prec_c that the students who failed to read all of the books failed the exam.
(\checkmark in plausible contexts)

We have explained why the discourse in (22) is unproblematic for our assumptions about the existential presupposition of *even* – the focus marking in the second sentence of (22) can be broader than indicated in (21). The attentive reader might have observed that since our discussion of (22) eschews any mention of embedded exhaustification, it constitutes a possible alternative account of the puzzle that is at the heart of this paper: if the focus in (8) were broader than what we assumed, e.g. if the entire VP or some bigger constituent were focused, the data in (8) could be explained without recourse to embedded exhaustification. Namely, as we have just shown for an occurrence of (8b) in (22), if the focus is on the VP or some bigger constituent containing the accented strong element, the domain of *even* may consist of logically independent alternatives even in the absence of embedded exhaustification, making it possible for *even* to trigger satisfiable presuppo-

sitions. However, for the required prosodic marking to be licensed – *all* is accented but the focus is on the VP or some bigger constituent – it is necessary to have an appropriate linguistic antecedent in the discourse, as illustrated in (23) and (24). Since the sentences in (8) can be uttered felicitously in contexts in which such linguistic antecedents are missing, e.g. out of the blue or in response to the question *how was the exam*, the possible alternative account is untenable.⁶

2.5 Consistency does not imply plausibility

The availability of embedded exhaustification does not lead to undesirable predictions vis-à-vis (10). On the one hand, if the sentences in (10) are parsed without exhaustifying the embedded clauses, their scalar presuppositions are unsatisfiable. Namely, in this case all the alternatives in the domain of *even* entail the prejacent, as we have illustrated in the discussion of (9), and so none of them can be more likely or less noteworthy than the prejacent. On the other hand, if the embedded clauses are exhaustified, as in (28), the scalar presuppositions that are triggered by *even* are consistent but not satisfied in plausible contexts in which the expectation is that the more you read, the better you do in exams.

⁶The alternative account would be viable if the required antecedents could be accommodated (see Wagner 2012 on givenness and antecedent accommodation). A putative example of such accommodation is given in (i) (discussed in Wagner 2012): the embedded clause in the second sentence of B's reply is focused due to question-answer congruence, though only its subject is accented. Since an antecedent that would license this non-default prosody appears to be absent, one might conclude that it is accommodated.

- (i) A: What happened?
B: I thought good fiction is valued in the country. Well, I just read that [A SUPERMAN comic made the best-seller list]_F.

However, since a constituent counts as given if it is contextually entailed by an antecedent in the discourse (cf. Schwarzschild 1999), *make the best-seller list* could count as given in (i) if we assume that it is contextually entailed by *be valued*. That is, rather than accommodating antecedents, we accommodate contextual entailment relations in examples like (i) (cf. implicational bridging in Rooth 1992). This is supported by the fact that leaving out the first sentence of B's reply makes the discourse infelicitous. Although a more thorough investigation of these issues is in order, we conclude that accommodation of antecedents is unavailable in the form and in the extent that would be needed by the alternative account to deal with (8).

- (28) a. [even C₂] [if [exh C₀] [John read all_F of the books] he will pass the exam]
 b. [even C₃] [the students [1 [exh C₀] [t₁ read all_F of the books]] passed the exam]
 c. [even C₄] [everyone [1 [exh C₀] [t₁ read all_F of the books]] passed the exam]

For example, it plausibly holds that John's passing the exam if he read all of the books is more likely than him passing the exam if he read just some of the books – but (28a) presupposes that it is less likely (29a).

- (29) a. $\llbracket(28a)\rrbracket^{g,c}$ is defined only if that if John read all of the books he will pass the exam \prec_c that if John read some but not all of the books he will pass the exam.
 (# in plausible contexts)
 b. $\llbracket(28b)\rrbracket^{g,c}$ is defined only if that the students who read all of the books passed the exam \prec_c that students who read some but not all of the books passed the exam.
 (# in plausible contexts)
 c. $\llbracket(28c)\rrbracket^{g,c}$ is defined only if that everyone who read all of the books passed the exam \prec_c that everyone who read some but not all of the books passed the exam.
 (# in plausible contexts)

However, the scalar presuppositions in (29) would be satisfied in contexts in which the opposite expectation would obtain, i.e. the expectation that the less you read, the better you do in exams, and in such contexts the sentences in (10) are acceptable.

To summarize, we have shown that the data in (8) are compatible with the standard approach to *even* if we adopt the grammatical device of covert exhaustification (Fox 2007, Chierchia et al. 2011). In this case, the sentences have a parse that is compliant with the condition in (7): the strong scalar item with which *even* associates in (8) is not in a scale-reversing but rather a non-monotone environment that is induced by an embedded *exh*. Moreover, the scalar presuppositions triggered by *even* in the parses of (8) with an

embedded *exh* are satisfied in plausible contexts, while this is not the case in (10). In the remainder of the paper, we turn to the following four issues: (i) the fact that according to our analysis embedded exhaustification may be available in environments in which it weakens the meaning of the sentence, (ii) the variation in the robustness of embedded scalar implicatures in different environments and its ramification for our proposal, (iii) a previously neglected difference between covert and overt exhaustification with *only*, and (iv) the question whether we find covert exhaustification interacting with focus particles other than *even*.⁷

3 Issues

3.1 Economy and embedded exhaustification

Scalar implicatures are not generated freely in embedded environments. Most significantly, they tend not to be generated in the scope of scale-reversing operators. To capture this generalization in the grammatical approach to scalar implicatures, Fox & Spector (2009) and Chierchia et al. (2011) propose that the distribution of *exh* is subject to the economy condition that *exh* should not be semantically vacuous or weakening. Consequently, *exh* should be illicit in the scope of a scale-reversing operator unless this operator is itself embedded under a non-upward-entailing operator (cf. the aforementioned pa-

⁷Another issue raised by our proposal relates to the discussion of so-called multiple focus constructions (e.g. Krifka 1991, Wold 1996). Namely, in our treatment in the main text, we argue for a configuration where two nested alternative-sensitive operators, *even* and *exh*, associate with a focused scalar item (i). That is, we have assumed that *exh* does not use up the alternatives induced by *all*, though we have for ease of exposition not formalized this with multiple focus marking and selective focus association. (Note that the same assumption is also needed by Fox 2007 in his treatment of free choice disjunction.)

- (i) [even C₄ [if [exh C₃ [John reads all_F of the books]] [he will fail the exam]]
-

It is a matter of ongoing debate whether association across an alternative-sensitive operator, as in (i), is possible (see Beck 2009 and references cited therein). We defer a detailed investigation of the question how the proposed association pattern in (i) relates to the debate on multiple focus constructions and potential nuances among them.

pers for details). This condition is clearly not met by the parses in (14) where *exh* is in the scope of scale-reversing operators that are not embedded under a non-upward-entailing operator.⁸

More concretely, in selecting the parses of the three sentences in (8), the economy condition applies to the three sets of competitor structures (reference sets) in (30), respectively. These sets consist of the structures in (14) and their counterparts without *exh*. The economy condition dictates that if the meaning of one structure in the reference set asymmetrically entails the meaning of another, the former structure is preferred to and hence blocks the latter one (see Fox & Spector 2009, Chierchia et al. 2011). Since the structures in (30) without *exh* have unsatisfiable presuppositions, as indicated in (9), their meanings trivially entail the meanings of the structures with *exh* and so the former structures will be preferred to and hence block the latter ones. We are faced with a dilemma: while we crucially rely on structures that contain an embedded *exh* to account for the distribution of *even*, these structures apparently violate the independently motivated economy condition on the distribution of *exh*.

- (30) a. { [even C₃] [if [exh C₀] [John reads all_F of the books] he will fail the exam],
[even C₂] [if John read all_F of the books he will fail the exam]}
b. { [even C₃] [the students [1 [exh C₀] [t₁ read all_F of the books]] failed the exam], [even C₂] [the students [1 [t₁ read all_F of the books]] failed the exam]}
}

⁸The economy condition is met in the examples of embedded implicatures in the antecedents of conditionals discussed by Chierchia et al. (2011), exemplified in (ia) (Levinson 2000:206). This is because examples like (ia) can be parsed as containing both a matrix and an embedded exhaustivity operator (ib), i.e. the scale-reversing operator that embeds *exh* is in the scope of a non-upward-entailing operator. A consequence of this is that the embedded exhaustivity operator is not semantically vacuous/weakening. However, a similar rescue strategy cannot be applied in the examples in the main text where matrix exhaustification is unavailable due to its incompatibility with the existential presupposition of *even*, as discussed in section 2.3.

- (i) a. If John owns two cars, the third one in the driveway must be someone else's.
b. [exh C₁] [if [exh C₀] [John owns two cars] the third one must be someone else's]

- c. { [even C₃] [everyone [1 [exh C₀] [t₁ read all_F of the books]] failed the exam],
[even C₂] [everyone [1 [t₁ read all_F of the books]] failed the exam] }

This application of the economy condition ignores the fact that the structures without an embedded *exh* in (30) have inconsistent meanings. The conundrum can be resolved by either (i) precluding structures that have inconsistent meanings, e.g. structures that trigger unsatisfiable presuppositions, from reference sets that enter into economy considerations or (ii) by modifying the economy condition so that it disfavors structures with inconsistent meanings. This means that either (i) the relevant reference sets for (8) are singletons containing the three structures in (14), respectively, and so these structures are trivially selected by the economy condition or (ii) the structures in (14) are preferred over their alternatives because they have consistent meanings. Deciding between the strategies in (i) and (ii) brings up subtle issues that go well beyond the scope of this paper.

3.2 Variation in the robustness of embedded scalar implicatures

In addition to the economy condition described in the preceding section, further constraints may be operative in determining the distribution of embedded scalar implicatures. This is supported by the observation that there is quite some variation in the robustness of embedded scalar implicatures in different types of environments (e.g. Fox & Spector 2009, Chemla & Spector 2011, Ippolito 2011).⁹ This variation plausibly plays a role in the evaluation of sentences discussed in this paper: the ease or difficulty of embedding *exh* in a particular scale-reversing environment may well be reflected in the felicity or infelicity of an unembedded *even* associating with a strong element in this environment. More specifically, the unacceptability of (8c) for some speakers – unembedded *even* associating with a strong element in the restrictor of *every* – may correlate with the potential difficulty of these speakers to embed *exh* in this environment. Likewise, if there

⁹I am grateful to Emmanuel Chemla and Danny Fox for discussing these issues with me.

is a scale-reversing environment in which embedded exhaustification is universally dis-preferred, all speakers should have a difficulty with unembedded *even* associating with a strong element in this environment. Although a more wide-ranging and systematic inquiry of these issues is necessary, the reasoning above receives some measure of support from contrast between *doubt* and plural definite descriptions.

Embedded scalar implicatures appear to be robust in the restrictor of a plural definite description (cf. Levinson 2000). This is illustrated on the basis of (31): the discourse would be infelicitous if the restrictor of the definite description in the first sentence were not exhaustified, i.e. if it did not refer to students reading some but not all of the books.

(31) The students who read some of the books failed the exam but also the students who read all of the books did.

Namely, without embedded exhaustification, the first sentence would entail the second sentence, making the discourse pragmatically deviant. More specifically, without embedded exhaustification, the discourse in (31) should have the same status as the discourse in (32) where the exhaustification of the restrictor in the first sentence is vacuous (see Chierchia et al. 2011, section 3).

(32) #The students who read some or all of the books failed the exam but also the students who read all of the books did.

Since the discourse in (31) is licit, we conclude that embedded exhaustification is possible and robust in this environment.¹⁰ Accordingly, *even* may associate with a strong element

¹⁰Another explanation of the felicity of (31) is conceivable: the discourse is felicitous because of a context shift after the first sentence. Specifically, the domain of the definite determiner in the first sentence of (31) – but for some reason not in the first sentence of (32) – may be contextually restricted to students who read some but not all of the books and it may be expanded in the second sentence to contain all students. The meanings of the two conjoined sentences would in this case be logically independent and the discourse would be consistent even in the absence of embedded exhaustification. However, the discourse remains felicitous when prefixed with a sentence conveying that students who read all of the books are relevant. This rules out an explanation based on context shift since the prefixation makes the required contextual domain restriction in the first sentence unavailable (see von Stechow 1999 for discussion of shifting contexts).

in the restrictor of a plural definite description:

(33) Even the students who read ALL of the books failed the exam.

In contrast, the discourse in (34) is pragmatically marked relative to (31). This can be attributed to the difficulty of exhaustifying the sentential complement of *doubt* in the first sentence so that it would have the meaning that John read some but not all of the books.

(34) ?I doubt that John read some of the books but I also doubt that he read all of the books.

Accordingly, *even* associating with a strong element in this environment (35) is pragmatically marked relative to (33), even in contexts in which John is an avid reader that is more likely to read all of the books than just some of them.

(35) ?I even doubt that John read ALL of the books.

3.3 Overt exhaustification with *only*

The counterparts of the sentences in (8) in which the embedded exhaustivity operator is replaced by the exclusive focus particle *only* are infelicitous, as is shown in (36). If the joint assertive and presuppositional meaning of *only* were identical to the import of *exh* and if both alternative-sensitive operators were subject to the same economy considerations, the difference in felicity between (8) and (36) would be unexpected.

- (36) a. #Even if John read only ALL of the books, he will fail the exam.
b. #Even the students who read only ALL of the books failed the exam.
c. #Even everyone who read only ALL of the books failed the exam.

However, in addition to exhaustivity, *only* is known to give rise to a scalar inference (cf. Jacobs 1983 for an early characterization). As a separate inference, it is detectable especially (i) in examples where the alternatives over which *only* quantifies do not form an entailment scale, i.e. in examples where the alternatives can form a scale whose ordering does not coincide with increasing logical strength, and (ii) in examples in which the prejacent of *only* is highly noteworthy given the alternatives. This is illustrated in (37):

- (37) a. Jane is only a LIEUTENANT.
b. ?Jane spent only THIRTY years in the military.

(i) The alternatives induced in (37a) are mutually exclusive and the sole contribution of *only* appears to be the scalar inference that Jane's army rank is less noteworthy than other relevant military ranks. (ii) The alternatives induced in (37b) form an entailment scale and the sentence is pragmatically odd due to the high noteworthiness of spending thirty years in the military.

On the basis of examples like (37), it has been proposed that *only* operates on focus-determined scales and, in addition to its exhaustive and factive import, triggers the presupposition that its prejacent has low noteworthiness given the alternatives (e.g. Klinedinst 2005, van Rooy & Schulz 2007, Beaver & Clark 2008, among others). This guarantees that the contribution of *only* is not vacuous in (37a): the sentence with *only* triggers a presupposition about the low noteworthiness of Jane's military rank that its *only*-less counterpart lacks. It also explains the oddness of (37b): the presupposition that Jane spending thirty years in the military has low noteworthiness is not satisfied in contexts in which thirty years approaches the maximum time that one can spend in the military, which holds for most modern military organizations.

It is this scalar component of the meaning of *only* that is responsible for the infelicity of the sentences in (36). It requires the prejacent of *only* not to entail all the alternatives in the domain of *only* – if it entailed all of them, it could not be less noteworthy than any of them.

This requirement is clearly violated in the embedded clauses in (36), e.g. that John read all of the books entails that John read some of the books. Accordingly, the sentences end up with unsatisfiable scalar presuppositions. The sentence in (36a) triggers the unsatisfiable presupposition that John reading all of the books is less noteworthy than John reading some of the books; the sentences in (36b)-(36c) trigger the unsatisfiable presupposition that for every student x it holds that x reading all of the books is less noteworthy than x reading some of the books. The contrast in the felicity of the sentences in (8) and (36) is thus not an issue for our analysis but rather brings out a difference between *exh* and *only*: only the latter operator invariably gives rise to a scalar inference.

4 Exclusive particles and embedded exhaustification

An important generalization was brought up in the preceding section: as a consequence of its scalar presupposition, the prejacent of *only* may not entail all the alternatives in the domain of *only*. It consequently holds that if *only* associates with a weak element like *some*, a scale-reversing operator may not intervene between *only* and its associate by itself (38). This is because if a weak element like *some* is in the immediate scope of a scale-reversing operator, the minimal clause containing the operator will entail its alternatives in which the weak element is replaced by a stronger alternative and thus cannot be less noteworthy than them.

(38) **A prediction of the standard scalar approaches to *only***

If *only* associates with a weak element across a single operator at LF and this operator is scale-reversing, the scalar presupposition of *only* is unsatisfiable.

There are data that appear to be in conflict with this prediction, which parallel *mutatis mutandis* the data in (8). They are exemplified in (39) where unembedded *only* associates with a weak scalar item *some* that is embedded in an antecedent clause of a conditional, a

plural definite description and a restrictor of a universal quantifier, three scale-reversing environments. All speakers consider the first two sentences in (39) felicitous, while the last sentence is considered felicitous by some though not all speakers.

- (39) a. Only if John read SOME of the books will he fail the exam.
 b. Only the students who read SOME of the books failed the exam.
 c. %Only everyone who read SOME of the books failed the exam.

We spell out the puzzle presented by these data on the basis of (39a): if it holds that if John read some of the books he will fail the exam, then it *ipso facto* holds that if John read all of the books he will fail the exam and so the former proposition is at least as noteworthy as the latter proposition. This contradicts the scalar presupposition of (39a) on the construal in (40a), which requires the former proposition, the prejacent of *only*, to be less noteworthy than the latter proposition, an alternative in the domain of *only* (40b). Since the sentences in (39a)-(39b) are accepted by all speakers and the sentence in (39c) is accepted by at least some speakers, they must have a different structure than indicated in (40).

- (40) a. [**only C₁**] [**if John read some_F of the books he will fail the exam**]
 b. $\llbracket (40a) \rrbracket^{g,c}$ is defined only if that if John read all of the books he will fail the exam \prec_c that if John read some of the books he will fail the exam.

(# in all contexts)

The explanation that we provided for the data in (8), which relies on embedded exhaustification, naturally extends to the data in (39). If the antecedent clause, the plural definite description and the restrictor of *every* in (39) are exhaustified, as in (41), the scalar presupposition of *only* can be satisfied: the alternatives in the domain of *only* are in this case logically independent and the prejacent can be the least noteworthy alternative

among them. In fact, we know from our above discussion that the scalar presuppositions of (41) are satisfied in plausible contexts where the expectation is that the more you read, the better you do in exams – they are identical to the presuppositions in (16).

- (41) a. [only C₁] [if [exh C₀] [John read some_F of the books] he will fail the exam]
 b. [only C₁] [the students [1 [exh C₀] [t₁ read some_F of the books]] failed the exam]
 c. [only C₁] [everyone [1 [exh C₀] [t₁ read some_F of the books]] failed the exam]

For example, the structure in (41a) triggers the plausible presupposition that it is less noteworthy that if John read some but not all of the books he will fail the exam than that if John read all of the books he will fail the exam (42) (the presupposition is identical to the presupposition in (16a)).¹¹

- (42) [[(41a)]^{g,c} is defined only if that if John read all of the books he will fail the exam <_c that if John read some but not all of the books he will fail the exam.

(✓ in plausible contexts)

Finally, the cross-speaker variation in the acceptability of the example in (39c), in which *only* associates with a weak element in the restrictor of *every*, can be attributed to the difficulty of embedding *exh* in this environment (see the discussion in section 3.2). Moreover, the expectation is that if unembedded *only* associates with a weak element in

¹¹Two further parses with embedded exhaustification are possible for the sentences in (39): (i) *exh* is inserted in the immediate scope of *only* and (ii) *exh* is inserted both in the immediate scope of *only* and in the embedded clause. Depending on the approach to *only*, different predictions are made for (i) and (ii). First: on the approach to *only* that assumes that *only* triggers the presupposition that its prejacent or a higher ranked alternative is true (e.g. Beaver & Clark 2008), these structures have consistent interpretations. In particular, it holds that the parses (i) and (ii) have non-scalar meanings that entail the non-scalar meanings of the parses in (41); the scalar presuppositions of the different parses are logically independent, though all appear to be satisfied in plausible contexts. Second: on the approach to *only* that assumes that *only* triggers the presupposition that its prejacent is true (e.g. Horn 1972), the parses (i) and (ii) have pragmatically illicit meanings – their presuppositions entail their assertive meanings; they are consequently ruled out.

a scale-reversing environment that is averse to embedded scalar implicatures, the sentence should universally be considered odd. Strikingly, this prediction is borne out: the sentence in (43) is pragmatically marked relative to the sentences in (39) for all speakers, again mirroring *mutatis mutandis* the data with *even* discussed in section 3.2.

(43) ?I only doubt that John read SOME of the books.

To summarize, we have identified another focus particle, *only*, whose distribution can be understood only by relying on the mechanism of embedded exhaustification. Since *only* triggers a scalar presupposition that is the inverse of the scalar presupposition of *even*, the signature of the examples showing this reliance is the opposite of the ones that we presented for *even*: they consist of *only* associating with a weak element in the restrictor of a plural definite description and *every* and in the *if*-clause. We have shown that the scalar presupposition triggered by *only* in these configurations is satisfiable if the embedded clauses are exhaustified.

5 Conclusion and outlook

The scalar particle *even* triggers the presupposition that its prejacent is less likely or more noteworthy than the relevant alternatives. We have presented data that appear to invalidate this characterization – data in which *even* associates with a strong scalar item across a single scale-reversing operator. The appearance of a clash is removed if we treat the embedded clauses that contain the associate of *even* as exhaustified. In fact, the data provide a new argument for the availability of embedded exhaustification. Finally, a puzzle analogous to that of the distribution of *even* was presented for the exclusive focus particle *only*: the requirement of *only* that its prejacent be less noteworthy than the relevant alternatives appears to be obviated in some cases where *only* associates with a weak scalar item across a single scale-reversing operator. Analogously to our solution of the puzzle about *even*,

these data can be explained by exhaustifying the embedded clauses that contain the weak associate of *only*.

At least three avenues for future research should be mentioned. First: Other potential cases of interaction between *even* and covert exhaustification need to be investigated. In particular, if embedded exhaustification is able to rescue sentences in which *even* associates with a strong element across a single scale-reversing operator, it should in principle also be able to rescue sentences in which *even* associates with a weak element.¹² Second: In our structures, two nested alternative-sensitive operators associate with the same element. It should be explored (i) how the availability of such an association pattern relates to our understanding of multiple focus configurations (see footnote 7) as well as (ii) whether structures that are identical to ours except that nested *even* and *exh* associate with distinct elements are acceptable. Third: A more systematic exploration is required of the relationship between the availability of embedded exhaustification in different scale-reversing environments and the ability of unembedded *even* and *only* to associate with strong and weak elements, respectively, in these environments (see section 3.2).

¹²For example, if *even* associates with a weak element across an existential operator, the sentence may be felicitous if the scope of the existential operator is exhaustified – both the scalar and the existential presupposition of *even* may in this case be correct and compatible with the exclusive import of *exh*. A potential candidate for such interaction between *even* and *exh* is given in (ia) (modeled on examples by Bernhard Schwarz p.c.). To the extent the sentence is acceptable in appropriate contexts, it conveys that John can read several books in just one day and that this is less likely or more noteworthy than John being able to read several books in more than one day. This meaning can be derived from the LF in (ib) where *exh* is embedded in the scope of the existential modal and associates with *one*, while *even* takes scope above the modal (either it moves covertly above the modal or the modal is base-generated below *even* to where it reconstructs at LF).

- (i) a. John can read several books even in ONE day.
- b. [**even** C₁] [**can** [[**exh** C₀] [**John read several books in one_F day**]]]

Without embedded exhaustification, *even* would trigger an unsatisfiable presupposition in (i): all the alternatives to the sister of *even* would entail the prejacent of *even*. Naturally, the felicity of such examples depends on the availability of embedded exhaustification in the respective configurations and the two should be investigated in parallel.

References

- Beaver, David I. & Brady Z. Clark. 2008. Sense and sensitivity: How focus determines meaning. Blackwell.
- Beck, Sigrid. 2009. Multiple focus. Journal of Semantics 26. 159–184.
- Chemla, Emmanuel & Benjamin Spector. 2011. Experimental evidence for embedded scalar implicatures. Journal of Semantics 28. 359—400.
- Chierchia, Gennaro, Danny Fox & Benjamin Spector. 2011. The grammatical view of scalar implicatures and the relationship between semantics and pragmatics. In Paul Portner, Claudia Maienborn & Klaus von Heusinger (eds.), Handbook of semantics, Mouton de Gruyter.
- von Fintel, Kai. 1999. NPI licensing, Strawson entailment, and context dependency. Journal of Semantics 16(2). 97–148.
- Fox, Danny. 2007. Free choice and the theory of scalar implicatures. In Uli Sauerland & Penka Stateva (eds.), Presupposition and Implicature in Compositional Semantics, 71–120. Palgrave Macmillan.
- Fox, Danny & Benjamin Spector. 2009. Economy and Embedded Exhaustification. Hand-out from a talk at Cornell. MIT & ENS.
- Gajewski, Jon. 2011. Licensing strong NPIs. Natural Language Semantics 1–40.
- Geurts, Bart. 2011. Quantity implicatures. Cambridge University Press.
- Grice, Paul. 1975. Logic and Conversation. In Peter Cole & J.L. Morgan (eds.), Syntax and semantics, vol. 3, 41–58. Academic Press.
- Guerzoni, Elena. 2003. Why even ask? On the pragmatics of questions and the semantics of answers: Massachusetts Institute of Technology dissertation.

- Heim, Irene. 1984. A note on negative polarity and downward entailingness. In Proceedings of NELS, vol. 14 1983, 98–107.
- Heim, Irene & Angelika Kratzer. 1998. Semantics in generative grammar. Blackwell.
- Herburger, Elenea. 2000. What counts: Focus and quantification, vol. 36. The MIT Press.
- Horn, Larry R. 1972. On the semantic properties of logical operators in English: UCLA dissertation.
- Ippolito, Michela. 2011. A Note on Embedded Implicatures and Counterfactual Presuppositions. Journal of Semantics 28(2). 267–278.
- Jacobs, Joachim. 1983. Fokus und Skalen. Niemayer.
- Karttunen, Lauri & Stanley Peters. 1979. Conventional implicature. In C.-K. Oh & D. A. Dinneen (eds.), Syntax and semantics, vol. 11, 1–56. Academic Press.
- Klinedinst, Nathan. 2005. Scales and 'only'. Unpublished ms. UCLA.
- Krifka, M. 1995. The semantics and pragmatics of weak and strong polarity items. Linguistic Analysis 25. 209–257.
- Krifka, Manfred. 1991. A compositional semantics for multiple focus constructions. In Joachim Jacobs (ed.), Informationsstruktur und Grammatik, vol. 4 Linguistische Berichte, Sonderheft, 17–53. Westdeutscher Verlag.
- Lahiri, Utpal. 1998. Focus and negative polarity in Hindi. Natural Language Semantics 6. 57–123.
- Landman, Fred. 1998. Plurals and maximalization. In Susan Rothstein (ed.), Events and grammar, Kluwer.
- Levinson, Stephen. 2000. Presumptive meanings: the theory of generalized conversational implicature. MIT Press.

- Lycan, William G. 1991. *Even and even if*. Linguistics and Philosophy 14(2). 115–150.
- Rooth, Mats. 1985. Association with focus: University of Massachusetts, Amherst dissertation.
- Rooth, Mats. 1992. Ellipsis redundancy and reduction redundancy. In Steve Berman & Arild Hestvik (eds.), Proceedings of the Stuttgart Ellipsis Workshop, .
- van Rooy, Robert. 2003. Negative polarity items in questions: Strength as relevance. Journal of Semantics 20(3). 239–274.
- van Rooy, Robert & Katrin Schulz. 2007. *Only*: Meaning and Implicatures. In Maria Aloni, Alistair Butler & Paul Dekker (eds.), Questions and Answers, Elsevier.
- Rullmann, Hotze. 1997. *Even*, polarity, and scope. Papers in experimental and theoretical linguistics 4. 40–64.
- Sauerland, Uli. 2004. Scalar implicatures in complex sentences. Linguistics and Philosophy 27(3). 367–391.
- Schlenker, Philippe. 2004. Conditionals as definite descriptions (a referential analysis). Research on Language and Computation 2. 417–462.
- Schwarzschild, Roger. 1999. Givenness, AVOIDf and other constraints on the placement of accent. Natural Language Semantics 7. 141–177.
- Selkirk, Elisabeth. 1995. Sentence Prosody: Intonation, Stress and Phrasing. In John A. Goldsmith (ed.), The handbook of phonological theory, 550–569. Blackwell.
- Wagner, Michael. 2012. Focus and Givenness: A Unified Approach. In Ivona Kučerová & Ad Neeleman (eds.), Contrasts and positions in information structure, Cambridge University Press.

Wold, Dag E. 1996. Long distance selective binding: The case of focus. In T. Galloway & S. Spence (eds.), Proceedings of SALT, vol. 6, 311–328.