

A scalar presupposition with universal force: *Only* as (only) a scalar mirror image of *even*¹

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Abstract

An intuition that can be found in the literature on the focus sensitive particle *only* is that there is a sense in which it is a scalar antonym or mirror image of *even*. This intuition, though, is not captured by the entries most often assigned to this particle, namely **non-scalar** and **scalar** entries, asserting the falsehood of all / all stronger alternatives to the prejacent, *p*, in C, respectively. An entry which gets closer to capturing this mirror imaged relation is what I call a **hybrid** entry (cf. Guerzoni 2003) presupposing all alternatives to *p* in C to be stronger than it and asserting all distinct alternatives in C to be false. In this paper I supply novel arguments for preferring this entry over the more commonly used entries. I show that using the **hybrid** entry allows a straightforward explanation of the infelicity of *only* in the presence of some discourse salient material, and the fact that this infelicity parallels infelicity of *even* in mirror imaged cases. In contrast, **non-scalar** and **scalar** entries cannot capture this infelicity, crucially not even when augmented with ‘mirativity/evaluativity’ (or non-vacuity) constraints. I argue that this is because, unlike *even*, which is a true evaluative particle (presupposing a ‘higher than the standard’ degree for both *p* and its alternatives), mirativity / evaluativity (indicating ‘lower than expected’ / ‘lower than the standard’) is neither a necessary nor a sufficient condition for the felicity of *only*, and should not be hardwired into its semantics. Instead I suggest a way to derive mirative / evaluative effects of *only*, as well as cases where these effects disappear, from the **hybrid** entry and some assumptions about accommodation of alternatives into C.

Thus, besides the mirror imaged scalar ordering (between *p* and its all distinct alternatives in C), *only* and *even* should not be seen as ‘mirative / evaluative’ mirror images. Neither should they be taken as mirror images in terms of exclusivity vs. additivity, due to independently made claims indicating that *even* is not a true additive particle. I show that adopting the **hybrid** entry of *only* (but not the **non-scalar** or **scalar** entries), where scalarity and exclusivity are separated components, allows us to capture this limited mirror imaged picture, and take *only* to be a member of the typology of scalar particles cross linguistically. Finally, I discuss parallel challenges for the universal quantification over alternatives in the scalar presuppositions of both *only* and *even*, and argue that they can be uniformly solved by appropriately constraining the balance between the contribution of discourse salient material vs. lexicon for constructing alternatives in C, though the precise way to do that still requires research.

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0. Introduction

The semantics of the English focus sensitive particle *only* has been under considerable attention and debate for a long time, with a relatively large number of lexical entries suggested in the literature for this particle, and a large number of arguments for and against these entries. In this paper I take a new perspective in examining this particle, focusing on three schematic types of entries suggested for it in the literature. The first is a classical **non-scalar** entry, asserting the exclusion of all distinct focus alternatives to the prejacent of *only*, p , in C , the set of contextually supplied focus alternatives to p . The second is a **scalar** entry, asserting the exclusion of all ‘stronger’ such alternatives on a scale. And the third is a less commonly used entry, which I will call **hybrid**, as it includes both a scalar component - presupposing that all distinct alternatives in C are stronger than p - and a non-scalar one - asserting that all distinct alternatives in C are false.²

The new perspective to look at the choice between these entries concerns the relationship of *only* to another well-studied focus sensitive particle, namely English *even*. The idea that the two particles are related is also rather old. In particular, an intuition that can be found in the literature regards *only* and *even* as some sort of scalar mirror imaged particles or scalar antonyms. This intuition, though, is not captured by the entries which are most often assigned to *only* in the literature, namely the **non-scalar** and **scalar** entries. The **hybrid** entry of *only*, on the other hand, gets closer to capturing this ‘scalar antonymy with *even*’ intuition. The main part of the paper is devoted to provide other, novel arguments in favor of this **hybrid** entry of *only*, which although still related to the relationship with *even*, are more empirical in nature. As we will see below this will also help us make the ‘antonymy’ intuition more precise, and in particular help to get a clearer about what does and what does not make *only* a mirror image of *even*.

The paper is structured as follows: In section 1 I briefly review the intuition about the scalar antonymy of *even* and *only* and show why neither the **non-scalar** nor the **scalar** entries capture it. In section 2 I examine a more concrete challenge for these two entries, namely observations about cases where *only* is infelicitous in the presence of some discourse salient material. I show that adopting some reasonable assumptions about the way alternatives are constructed (cf. Fox & Katzir 2011, Katzir 2014), the infelicity of *only* in such cases constitutes a real puzzle for both the **non-scalar** nor the **scalar** entries, and neither can explain them, not even when augmented with independently suggested constraints on non-vacuity or mirativity / evaluativity. In particular, I bring new arguments showing that mirativity / evaluativity is not a necessary condition for the felicity of *only* and should not be hardwired into its

² For all entries I will adopt the assumption that the prejacent, p , is presupposed. This assumption is debated in the literature, but as it is not the focus of this paper I will not dwell into the debate here.

lexical entry, and that neither it nor a constraint on non-vacuity are sufficient conditions for the felicity of *only* either.

In section 3 I examine a solution to the infelicity puzzle. I start by reviewing a version of the **scalar** entry of *only*, in Orenstein & Greenberg 2013, Orenstein 2016, which provides a local fix of the puzzle. I then turn to the **hybrid** entry, which provides a more general explanation of the infelicity of *only*, and in doing so parallels the way the classical entry of *even* accounts for parallel cases of infelicity with this particle. Section 4 I examines challenges for the universal quantification over alternatives in the **hybrid** entry of *only*, namely the felicity of *only* in cases where potentially relevant weaker alternatives are assumed to be part of C. I point out that precisely the parallel challenge has been independently raised against the universal quantification in the scalar presupposition of *even*. I argue that maintaining the universal quantification in the scalar presuppositions of both particles, while constraining the C sets they operate over, is preferable over weakening the quantification over alternatives in C (although the precise constraints on C still need to be further clarified).

Two more indirect supports for the **hybrid** entry are examined in sections 5 and 6. In section 5 I suggest a way to derive mirativity/evaluativity effects of *only*, as well as cases where such effects disappear, using the **hybrid** entry and constraints on accommodating alternatives into C (based on ideas raised in Krifka 2000). An implication of the discussion in this section is that while *only* and *even* are indeed antonyms in terms of the scalar ordering between their prejacent and all their alternatives in C, they are not ‘mirative’ or ‘evaluative’ antonyms, and more generally that scalarity and mirativity / evaluativity should be treated separately. In section 6 I examine existing reports of scalar – *even*-like and *only*-like - particles cross linguistically, which were claimed to vary along parameters like scalar ordering, additivity vs. exclusivity, etc.. I argue that given these reports scalarity and exclusivity of scalar particles are independent components, as in the **hybrid** entry of *only*, but not as in the **non-scalar** entry (where scalarity is not captured) or the **scalar** one (where exclusivity is a special case of scalarity). Thus adopting the **hybrid** entry of English *only* makes it easier to view it as part of the typology of scalar particles as well. In that section I also argue that *only* and *even* should not be taken to be mirror imaged particles along the exclusivity vs. additivity parameter, given challenges for the claim that *even* triggers an additive presupposition. Section 7 summarizes the ways *only* can (and cannot) be considered a mirror image of *even* and points out some directions for further research.

1. Background: Two popular entries for *only* and the ‘scalar antonymy with *even*’ intuition

The intuition that *only* and *even* are in some sense opposites, or express some mirror imaged relation has been expressed in various theories studying these particles. Zeevat 2013 writes that:

Only (and other exclusive particles like *just* or *merely*) expresses that the size of something is disappointingly small: one expected more. Similarly, *even* expresses that one expected less. (p. 301)

Beaver & Clark 2008 write that:

in considering the meanings of *only* and *even*, one is tempted to say that they are, in some sense, opposites. Yet is hard to put one's finger on the nature of this intuitive antonymy.We suggest that *only* and *even* might best be labeled PRAGMATIC ANTONYMS (p. 71)

To illustrate this 'pragmatic antonymy' Beaver & Clark compare (1a) and (1b) and say:

(1) a. *David only wears a bow tie when [teaching]_F*

b. *David even wears a bow tie when [teaching]_F*

"...whereas (1a) is appropriate if wearing a bow tie when teaching is **less**, e.g., eccentric than had been expected or previously indicated, (1b) is appropriate if wearing a bow tie when teaching is regarded as significantly **more**, e.g., eccentric than has been expected or previously indicated". (Beaver & Clark 2008, p. 71)

Beaver & Clark's intuition can be illustrated with many other minimal pairs. Another example is (2):

(2) (Context: We are arriving late to a committee meeting evaluating John's and Bill's academic achievements, and only manage to hear what one of the committee members says about Bill):

a.and Bill wrote [5]_F papers.

b.. ...and Bill *only* wrote [5]_F papers.

c. ...and Bill *even* wrote [5]_F papers.

In the absence of *only* or *even*, namely in (2a), we can accommodate any number of papers that John may have written.³ But once these particles are present we naturally make two opposite inferences. In (2b), with *only* we accommodate that the number of papers that John wrote is higher than 5 (e.g. that John wrote 6 papers), whereas in (2c) with *even* that it is lower than 5 (e.g. that John wrote 4 papers).

The intuition about the scalar 'antonymy' or 'mirror image' of *even* and *only* seems, then, rather strong. Moreover, as Zimmermann 2014 points out, this 'antonymy' seems to be backed up by cross linguistic data:

³ Probably a number distinct from 5.

The antonymic relation of exclusive and scalar particles is evidenced by systematic meaning flips with one and the same particle in different contexts: In many languages, an exclusive form gets a scalar *even*-interpretation in scale-reversing contexts (in the presence of additional material). (p. (4))

It is perhaps surprising, then, to see that the idea that *only* and *even* are scalar antonyms or opposites is not captured by the lexical entries that are usually used in the literature on these particles. To see this, let us first briefly review the lexical entry usually given to *even*. Following the works of e.g. Horn 1969, Karttunen & Peters 1979, Rooth 1985, 1992, this entry is some version or other of (3):

$$(3) //even//^{\mathbb{R},c} - \lambda C. \lambda p. \lambda w: \exists q \in C q \neq p \wedge q(w) = 1 \wedge \forall q \in C q \neq p \rightarrow p >_C q. p(w) = 1$$

Given (3), *even* presupposes that there is at least one true focus alternative to its prejacent (p) in the contextually relevant set of focus alternatives, C (the ‘additive presupposition’), and that p is the strongest alternatives in C on a scale (the ‘scalar presupposition’). It asserts that p is true. Consider for example (4):

$$(4) John \text{ even interviewed } [Susan]_F$$

Given (3), (4) triggers an additive presupposition that there is an additional focus alternative in C which is true (e.g. that John interviewed Mary), as well as a scalar presupposition, namely that the proposition that John interviewed Susan is ‘stronger’ on a scale than any other alternative in C distinct from it. It asserts that John interviewed Susan.

As is well known, there are several debated components in this entry of *even*. These concern, for example, the necessity of the additive presupposition in it, the universal quantification in the scalar presupposition, the nature of the scale, i.e. what the ‘stronger than’ relation, $>_C$, in (3) really amounts to, etc. I will postpone discussion of these debated components to later, and in the meantime continue to assume the entry in (3).

Turning now to the semantics of *only*, out of the many entries it has been given in the literature I will start by focusing on two schematic types (ignoring a variety of subversions of each such type), namely a **non-scalar** and a **scalar** entry for this particle. For both entries I will adopt the assumption that the prejacent of *only*, p , is presupposed (Horn 1969, Rooth 1992), although this assumption has been debated (cf. McCawley 1981, Atlas 1993, Horn 1996, 2002, 2011,; van Rooij & Schulz 2007, Ippolito 2008, Beaver & Clark 2008, Beaver & Coppock 2014 among others).

The **non-scalar** entry, assumed in e.g. Horn 1969, Karttunen & Peters 1979, Rooth 1992, Krifka 1992 is seen in (5):

$$(5) //only_{non-scalar}//^{\mathbb{R},c} = \lambda C. \lambda p. \lambda w: p(w) = 1. \forall q \in C q \neq p \rightarrow q(w) = 0$$

This is the classical ‘exclusive’ entry of *only*, presupposing the truth of p and asserting the exclusion, i.e. the falsehood of all distinct alternatives to p in C , the set of contextually supplied focus alternatives to p , as illustrated in (6):

(6) *John only interviewed [Susan]*_F

Given (5), (6) presupposes that John interviewed Susan is true, and has a ‘non-scalar’ assertion that all other distinct alternatives in C (e.g. that John interviewed Mary, that John interviewed Bill), are false. This naturally derives the inference that John interviewed Susan and nobody else, at least nobody else who is relevant.⁴

As Horn 1969 points out, this entry captures one kind of mirror image relation between *only* and *even*, namely that “*even* (like *also*) asserts what *only* presupposes” i.e. that p is true, and “presupposes the negation of what *only* asserts” (Horn 1969: 106), i.e. that some relevant distinct alternative to p in C is true.⁵ However, this **non-scalar** entry does not capture at all the intuition that *only* and *even* are scalar antonyms, simply because, as its name suggests, it does not contain any reference to a scale whatsoever, and hence does not make any requirement as to alternatives which are stronger or weaker than p . This stands in a sharp contrast to *even*, which dictates a specific scalar ordering between p and its alternatives in C .

One could think, then, that the **scalar** entry for *only*, which as its name suggests does make reference to a scale, *would* be able to capture the ‘scalar antonymy’ with *even*. But this is not the case either. There are various versions of this kind of entry, found in e.g. Horn 1969, Klinedinst 2005, Beaver and Clark 2008, Roberts 2011, Coppock & Beaver 2014, Alxatib 2013, Liu 2017, and others. Abstracting away from differences between these versions, I will schematize this **scalar** entry as in (7), according to which *only* (C)(p)(w) presupposes the truth of p and asserts that all distinct alternatives in C which are stronger than p on a scale, are false:

(7) $\llbracket \text{only}_{\text{scalar}} \rrbracket^{\mathcal{G},c} = \lambda C. \lambda p. \lambda w: p(w)=1. \forall q \in C [q \neq p \wedge q >_c p] \rightarrow q(w)=0$

Originally, this kind of entry was taken to capture the meaning of just a subset of the uses of *only*, namely those as in (8) (where *only* usually associates with a predicate):

- (8) a. *John is only a [clerk]*_F (He doesn’t have a more prestigious profession, e.g. he is not a manager)
 b. *I only wanted to [speak]*_F with John (I didn’t want to do anything more intimate,

⁴ To avoid contradictions when p contains a plural focused element with alternatives which are entailed by it (as in *John only met Susan and Mary*), it was suggested only alternatives which are not entailed by p are excluded (cf. Rooth 1992, Krifka 1993, Schwarzschild 1994). This will not play a crucial role in our main claims below.

⁵ In section 6 we will review some of the claims against the additivity of *even*, thus undermining this kind of mirror image relationship with *even*.

e.g. kiss John)

The use of *only* in such cases was called ‘scalar’, and was distinguished from its use in e.g. (6), which was called ‘non-scalar’. Horn 1969, for example, explicitly claimed that *only* is ambiguous between the two uses. In later theories (e.g. Klinedinst 2005, Beaver & Clark 2008, Roberts 2011, Coppock & Beaver 2014) the **scalar** entry for *only* in (7) was argued to apply to all uses of *only*, crucially including also those which were originally taken to be ‘non-scalar’. The two types of readings were taken to differ only in the type of scale that *only* operated on: ‘rank-order’ or ‘evaluative’ scales in the case of (8) (where, e.g. being a clerk is lower on a scale measuring prestige than being a doctor, but is not entailed by it, etc.), and ‘entailment-based’ scales in cases like (6).

Given this line of thought, for example, (6) presupposes the falsehood of all alternatives in C stronger than *John interviewed Susan* on an entailment scale, i.e. those which asymmetrically entail it, like *John interviewed Susan and Mary*, *John interviewed Susan and Mary and Bill*. Conjoining the presupposed truth of the prejacent (e.g. *John interviewed Susan*) with the asserted falsehood of all such stronger alternatives elegantly managed to derive the exclusivity effect of *only* in such sentences (“John interviewed Susan and nobody else”) as a special case of its scalarity (“John interviewed Susan and not more than that on an entailment-based scale”).

Now crucially, although the **scalar** entry of *only* in (7) does indeed differ from the **non-scalar** one in (5) in making reference to scales, it is still unable to capture the intuition that *only* and *even* are scalar antonyms or mirror images. In particular, unlike the scalar component (a presupposition) of *even* in (3) which dictates a certain strength relation between *p* and its alternatives, namely that *p* is stronger than all its alternatives in C, the scalar component in (7) (an assertion) does not dictate any such relation at all. All it requires is that those alternatives in C which are stronger than *p* on the scale are false.

We can see, then, that neither the **non-scalar** nor the **scalar** entries of *only* captures the ‘antonymy-with-*even*’ intuition.

But is this a serious drawback of these entries? Is capturing this intuition so significant, given the other advantages of these two popular entries argued for in the literature? And is a ‘scalar antonymy’ between *only* and *even* linguistically real to start with, beyond the inferences mentioned above?

In the next section I argue that the answers to these questions are positive, and that there are other challenges for the **non-scalar** and **scalar** entries of *only*, which, although still related to the relationship between *only* and *even*, are more ‘empirical’ in nature, and concern not only inferences but also felicity contrasts. In section 3 I argue that a third and less commonly used entry for *only*, suggested by e.g. Guerzoni 2003, which I call **hybrid**, not only gets closer to capturing the ‘scalar antonymy’ intuition, but also copes much better with these challenges. Examining the behavior of *only* and *even* in light of this

entry will help us to eventually get a clearer and more precise understanding of what makes these particles scalar antonyms (and what doesn't).

2. An issue for the non-scalar and scalar entries: Some infelicitous uses of *only*

2.1 An infelicity puzzle

Orenstein & Greenberg 2013, Orenstein 2016 examine cases where there is salient material in the discourse which is not stronger than the parallel material in the prejacent of *only*. In such cases *only* is infelicitous. An example is (9):

(9) *John has at least 40 students and (#only) 40 came.* (Orenstein & Greenberg 2013, #7)

We will come back to the example in (9) below, and in section 3.1 review Orenstein & Greenberg's (2013), Orenstein's (2016) suggestion to capture the infelicity of *only* in it. Before that, however, let us illustrate the observation with simpler cases, as in (10). These involve a variety of types of scales, namely a numeral scale (10a), an entailment, semi-lattice-based scale (10b), an evaluative scale with incompatible alternatives (10c) and with compatible ones (10d). In all of these cases the VP in the salient sentence is weaker along the relevant scale than that of the prejacent of *only*, and *only* is odd:⁶

- (10) a. John wrote 5 papers. Bill (#only) wrote [6]_F
 b. Last year John collaborated with Susan and Ann. This year he (#only) is collaborating with [Susan, Ann and Henry]_F
 c. Bill won the bronze medal in the contest. John (#only) won the [silver medal]_F
 d. Last month John managed to interview the minister's assistant. This month he (#only) managed to interview [the minister]_F

How can the infelicity of *only* in these sentences be derived? To answer this question we should first understand what the sets of alternatives to the prejacent of *only* are in the cases above. We will follow here the assumption (Rooth 1992, Fox & Katzir 2011, Katzir 2014), that salient material, e.g. one which is explicitly mentioned in the discourse, is used to construct the actual focus alternatives in C. For now we will take the C sets are as in (11), containing at least *p* and an alternative built on the basis of the discourse salient VP in the context. In these sets the prejacent is underlined, and '....' indicates that other alternatives might be present as well:

⁶ Notice that (10c) can be improved if we accommodate a situation where e.g. John is a very successful player, who usually wins gold. The infelicity remains, however, in the close variants of (10c), namely (i) where we compare Bill's performance this year to last year:

(i) Last year Bill won the bronze medal in the contest. This year he (#only) won the [silver medal]_F

- (11) a. {...*John wrote 5 papers*, *John wrote 6 papers*}
 b. {... *John collaborated with Susan and Ann*, *John collaborated with Susan, Ann and Henry*}
 c. {...*John won the bronze medal*, *John won the silver medal*}
 d. {... *John managed to interview the minister's assistant*, *John managed to interview the minister*}

Given these C sets, then, we can form the following generalization regarding the infelicity of *only* in the (10a-d):

- (12) A generalization concerning the infelicity of *only*: When the C sets has an alternative to the prejacent of *only*, *p*, constructed based on discourse salient material which is not stronger than *p*, *only* is infelicitous.

Importantly, neither the **non-scalar**, nor the **scalar** entries of *only* can explain this generalization in a simple way. In particular, given the C sets in (11), the assertions and presuppositions of the infelicitous sentences in (10) can be fulfilled in a consistent way, with no problems for both entries for *only*. Take for example (10d). Both entries presuppose that Bill interviewed the minister, and assert that Bill interviewed no other individual, e.g. the minister's assistant or the prime minister (in the **non-scalar** entry) or that he interviewed no more important individual, i.e. the prime minister (in the **scalar** entry). Importantly, there is no problem with fulfilling the assertion and presupposition in this case. Similar reasoning holds for the rest of the infelicitous sentences in (10), involving other types of scales.

It seems, then, that if we maintain the **non-scalar** or **scalar** entries for *only* explaining the generalization in (12) constitutes a puzzle.

At this point, one is perhaps attempted to try and solve this puzzle by augmenting these entries with additional constraints on the semantics of *only*, independently suggested in the literature. Two such constraints which come to mind have to do with **non-vacuity**, and **mirativity / evaluativity**. However, we argue that neither of these can give a satisfactory explanation to the generalization in (12) and solve the infelicity puzzle. Specifically, in section 2.2 we reject an attempt to derive the infelicity of *only* in (10) using a **non-vacuity** constraint on *only*, based on arguments in Orenstein & Greenberg 2013, Orenstein 2016, and in section 2.3 we provide arguments against using the assumed **mirativity / evaluativity** of *only* to do so.

2.2 Non-vacuity of *only* cannot solve the infelicity puzzle

Various writers (Roberts 2011, Alxatib 2018) claimed that the infelicity of *only* in cases like (13) is due to a constraint on non-vacuous operation:

(13) (#*Only*) *everyone arrived to the party*

The constraint is relevant for the **scalar** entry of *only* in (7) above. If indeed the main operation of *only* is to assert that all alternatives stronger than *p* on a scale are false, this operation will be vacuous in case no alternative in C is stronger than *p* to start with. In (13) for example this is because *Everyone arrived* is logically stronger than all other alternatives such as *most individuals arrived*, *Someone arrived*, etc.

The alternatives in (13) are ordered along what is sometimes called a ‘Horn scale’, and they can be said to be supplied by replacing *everyone* with other quantifiers in the lexicon. However, one could argue that alternatives supplied by the context or discourse can also lead to a violation of the non-vacuity constraint. In particular, one could assume that *only* is infelicitous in (10a-d) above because the sets of alternatives for these sentences are not those in (11a-d) as assumed above, but rather those in (14a-d), where the alternatives constructed based on the discourse salient material are the only ones in C besides the prejacent:⁷

- (14) a. {*John wrote 5 papers*, *John wrote 6 papers*}
 b. {*John collaborated with Susan and Ann*, *John collaborated with Susan, Ann and Henry*}
 c. {*John won the bronze medal*, *John won the silver medal*}
 d. {*John managed to interview the minister’s assistant*, *John managed to interview the minister*}

If these are indeed the sets of alternatives to *p* in (10a-d), then the infelicity of these sentences can be derived using non-vacuity as well. Since the only alternatives to *p* in C in (14a-d) are weaker than *p*, then again there are no stronger alternatives to exclude, hence the operation of *only* is vacuous, thus leading to infelicity in a way similar to that in (13).

However, a non-vacuity-based explanation of the infelicity of *only* in similar sentences has been already rejected in Orenstein & Greenberg 2013, Orenstein 2016 who point out that (9) repeated here, is a case where *only* is infelicitous although there is a potential alternative stronger than *p*, namely *41 students came* (inferred based on the salient sentence *John has at least 40 students*):

(9) John has at least 40 students and (#*only*) 40 came.

⁷ I.e. the idea here would be that alternatives supplied by relying on real world knowledge and/ or the lexicon, e.g. that John wrote 7 papers in (10a), or that John won the gold medal (in (10c)) are or can be left out of C. In section 4 I argue that there is in fact quite good reason to assume that this is indeed what happens (for both *even* and *only*). However, as we will immediately see, even with this assumption a non-vacuity-based explanation is not enough to derive infelicitous uses of *only* as in (10).

Perhaps a more relevant observation in Orenstein & Greenberg 2013, Orenstein 2016, which further supports this conclusion, is the infelicity of *only* in sentences like (15), where the sentence with *only* is preceded by two sentence, one with VP stronger than that of *p* and one weaker than it:⁸

- (15) #Mira has two kids, Paul has four kids, but Jim has *only* three kids (Orenstein & Greenberg 2013, #15)

That is, *only* continues to be infelicitous although its operation here is not vacuous (since there is an alternative stronger than *p*, namely *Jim has four kids* which can be rejected. We can see the same pattern in the close variants of (10a-d) above, namely in (16a-d):

- (16) a. Henry wrote 7 papers this year. Bill wrote 5 papers and John (#only) wrote [6]_F
 b. *Two years ago John collaborated with Susan, Ann and Henry. Last year he collaborated with Susan, and this year he (#only) collaborates with [Susan and Ann]_F*
 c. *Henry won the gold medal in the contest, Bill won the bronze medal and John (#only) won the [silver medal]_F*
 d. *Two months ago John interviewed the prime minister. Last month he interviewed the minister's assistant and this month he (#only) managed to interview [the minister]_F*

Thus, even if we continue to assume that the only alternatives to *p* in the C sets are those constructed based on discourse salient material, the C sets for (16a-d), namely those in (17a-d) will differ from the ones in (14a-d) in containing alternatives which are stronger than the prejacent, and which can be rejected by the operation of *only*. The infelicity of *only* in such sentences, then, cannot be attributed to breaking non-vacuity:

- (17) a. { *John wrote 7 papers, John wrote 5 papers, John wrote 6 papers* }
 b. { *John collaborated with Susan, Ann and Henry, John collaborated with Susan, John collaborated with Susan and Ann* }
 c. { *John won gold, John won the bronze medal, John won the silver medal* }
 d. { *John managed to interview the prime minister, John managed to interview the minister's assistant, John managed to interview the minister* }

2.3. 'Mirativity' / 'evaluativity' of *only* cannot solve the infelicity puzzle either

2.3.1 A mirativity / evaluativity -based explanation of the infelicity puzzle?

Another constraint on the semantics of *only* widely assumed in the literature has to do with surprise / unexpectedness / mirativity (following deLancy's 1997 terminology). In particular, it has been claimed

⁸ This example is attributed to Malte Zimmermann (p.c.)

that an integral part of the semantic-pragmatic contribution of *only* is to indicate that its prejacent, *p*, indicates a degree (e.g. a number) which is lower than what is expected (Zeevat 2008), to express ‘not so much / not a lot’ or be lower than most / sufficiently many alternatives (Klinedinst 2004, 2005), or to indicate that the prejacent is lower than the expected answer to the Current Question (Beaver & Clark 2008). A wider characterization of the mirativity of *only*, suggested in e.g. Alxatib 2013, takes this particle to lead to an ‘evaluative’ inference, so its prejacent indicates a quantity or measure which is below what ought to be the case, or below a certain norm or standard on a relevant scale (similarly to the covert degree modifier *POS* with gradable adjectives), crucially even if this norm or standard are not directly tied to ‘expectations’, and violating it does not lead to a ‘surprise’ effect.

These proposed constraints on the semantics of *only*, which I will henceforth refer to as mirativity / evaluativity constraints, had two types of motivations. The first is the need to explain the fact that sentences like (18) indeed yield “less than expected / not a lot” inference:

- (18) *John only has 2 kids* (having 2 kids is not a lot / less than expected)

The second motivation is to explain infelicitous uses of *only* where such inferences seem to clash with other material or with real world knowledge. Examples of such cases are (19) (from Beaver & Clark 2008), where *p* is below what is explicitly said to be expected, (20) (from Klinedinst 2004) where *p* is below what is explicitly said to be the average, and (21), where *p* is naturally considered ‘a lot’, namely higher than what is expected / the average given our real world knowledge of typical (western) contexts:

- (19) I really expected a single room with 2 beds but (#only) got [a suite.]_F (B&C p.252)

- (20) The average score on the exam was a C. Mary (#only) got an [A-]_F (Klinedinst p. 4)

- (21) John (#only) has [8]_F kids (uttered in typical western contexts where 8 kids is a lot)

The judgements on these sentences seem fairly strong, and indeed the idea that mirativity / evaluativity is an inherent part of the semantics of *only* become very common in the literature. To quote Alxatib 2017:

Everyone knows that *only* is evaluative. The intuition.... is sometimes captured by writing into the semantics of *only* a presupposition that its prejacent rank low with respect to its alternatives, on whatever ordering is provided in context (p. 100).

Turning now back to our puzzle, we can see that the infelicity of *only* in sentences like (19)-(21) seems very similar to its infelicity in (10a-d) considered above and repeated here:

- (10) a. John wrote 5 papers. Bill (#only) wrote [6]_F
 b. Last year John collaborated with Susan and Ann. This year he (#only) is collaborating with [Susan, Ann and Henry]_F
 c. Bill won the bronze medal in the contest. John (#only) won the [silver medal]_F
 d. Last month John managed to interview the minister’s assistant. This month he (#only) managed to interview [the minister]_F

Perhaps, then, we can use the mirativity/evaluativity presupposition of *only* to account for this kind of infelicity as well. In particular, can't we simply claim that *only* is infelicitous in (10a-d) because in all of them *p* indicates a degree which is considered 'a lot', 'more than expected', or 'more than the standard', etc., similarly to what we find in (19-21)?

I believe that the answer to this question is negative. This has two reasons. First, it is not clear that mirativity /evaluativity is a necessary condition for the felicity of *only* and that it should be hardwired into its semantics. Second, even if we do assume that *only* is mirative / evaluative, this will not be sufficient to explain the infelicity of *only* in the type of cases we examined above. Let us examine each of these points in turn.

2.3.2 Mirativity / evaluativity is not a necessary condition for the felicity of *only*

Doubts regarding the claim mirativity in the sense of expressing a surprise / 'less than expected' is a necessary condition for the felicity of *only p* were raised in e.g. Roberts 2011, Orenstein & Greenberg 2013, Orenstein 2016 and others. Such doubts are based on cases where *only* is felicitous although *p* need not be considered 'less than expected' or surprising in any reasonable way. An example illustrating such cases is (22), from Orenstein 2016:

- (22) (Context: My mother and I are organizing a weekend for the whole family. We discuss the location where the families of my two sisters, Rina and Esti, will stay)
 Mom: Rina has four kids so she will stay in the this apartment. Esti has only three kids, so she can stay in that apartment. (Orenstein & Greenberg 2013 #9)).

As Orenstein (2016), points out in (22) *only* is felicitous although given the fact that it is the mother who utters the sentence there is no surprise indicated by the use of *Esti has only three kids*. Notice that there does not seem to be any expectation in a wider sense which is broken here, indicating that Esti should have more children, or that having three children is below some other standard. Instead the use of *only* in this sentence seems to be licensed simply due to the comparison with the higher number of children of Rina, indicated in the previous sentence, without any 'mirative' or 'below the relevant standard' effect.

Moreover, in many cases *only* keeps being felicitous although *p* seems to indicate a 'a lot', 'higher than expected', or 'higher than the relevant standard':

- (23) a. (The average score on the exam was B). John and Bill are checking their grades:
 John: *Wow! I got an A+!*
 Bill: *You got better than me, then! I only got an A. Wow! I am so happy!*
 b. (The average height for men here is 1.78m).

John is tall. He is 16 years old and already 1.85m tall. His 14 years old brother Bill is a bit shorter – he is only 1.83m tall.

Given the context in (23a) getting an A is more than the general standard. Nonetheless *only* is felicitous. Notice that *only* keeps being felicitous in this sentence not only if Bill is a wonderful student (so getting an A might be considered below his individual standard), but also if both he and John are average students, or if he is an average student and John is a great student, i.e. even if getting an A is clearly above his standard of success or what he expects to get. A similar picture is seen in (23b), where Bill's degree of tallness is more than expected and higher than the standard given the average population. He is also very tall given his age group and, in fact, even given his family standard. Nonetheless *only* is felicitous in this sentence as well. Again what seems to license *only* in both cases is not the fact that *p* indicates a degree which is less than expected / less than the relevant standard, but less than the one expressed in the sentence before it (i.e. John being 1.85m tall, John's getting an A+).

One could try to propose here that the very fact that a higher degree is mentioned in the previous sentences makes it the 'relevant standard' or expectation, e.g. that the saliency of John's grade in (23a) (A+) or of John's height in (23b) (1.85m tall) sets them as high standards or expected values, so *only* is licensed in these sentences because Bill's grade (an A) or height (being 1.85m tall) can be considered 'less than expected / less than the standard' after all.

Such a proposal, however, seems rather ad hoc and is not independently motivated. Given the contexts in (23) the higher degrees actually do not seem to constitute relevant standards or expectations for Bill, and the prejacent of *only* themselves express degrees which are 'a lot' and higher than the relevant standard for him. More generally, adopting such a proposal will give the notions of expectations / standards / norms a much wider sense than the one usually used in the literature and motivated by the linguistic expression of these notions in other constructions (e.g. those involving gradable expressions). Doing that will in fact reduce the claim that *only* is mirative / evaluative to the descriptive generalization in (12) above.

Moreover, there is also a novel observation which indirectly supports the claim that the prejacent of *only* in (23a,b) are indeed not understood as 'less than the standard, which concerns the way *even* and *only* interact. In particular, notice that *only* in Bill's utterance in (23a) continues to be perfectly felicitous when we add *even* to the sentence before it, as in (24a). Similarly, *only* is felicitous in the presence of *even* in (24b):

- (24) a. (The average score on the exam was B): . John and Bill are two average students are checking their grades:

John: Wow! I got an A!

Bill: You even got better than me, then - I only got an A. Wow! I am so happy!

b. John is 1.85m tall. He is even taller than me, then – I am only 1.83m

This interaction of *even* and *only* here is significant since it was independently claimed that *even* is truly evaluative, i.e. imposes sensitivity to standards (though not to ‘expectations’ or likelihood) with respect to both its prejacent and its alternatives. Specifically, Greenberg 2015, 2017 argues that part of the scalar presupposition of *even* is that it both *p* and its alternatives indicate a degree on a contextually provided scale which is at least as high as the standard / norm on this scale. To illustrate consider for example (25a,b):

(25) a. (John is tall / #not tall / #short). He is 1.70m tall, and Bill is even 1.75m.

b. (John is tall / #not tall / #short). He is 1.70m tall and Bill is even taller than him.

Due to the presence of *even* in (25a) the sentence presupposes that both being 1.70m tall as well as being 1.75m tall are considered *pos tall*, i.e. are at least as high as the standard of tallness. Among other things this is indicated by the infelicity of “John is not tall / short”, which crucially become fine once we remove *even*. As shown in (25b) the same holds with a comparative. Greenberg 2015, 2017 shows that this kind of evaluative ‘at least as high as the standard’ effect for both *p* and its alternatives is evidenced in many other examples with *even* (as well as with other *even*-like particles in other languages (cf. Greenberg (to appear))).

To capture this effect Greenberg suggests that in addition to the ‘scalar ordering’ presupposition of *even*, requiring *p* to be ‘stronger’ than its alternatives *q*, the semantics of *even* should also include an explicit ‘evaluativity’ presupposition. To do that Greenberg defines a ‘gradability-based’ presupposition for *even* as in (26), which is based on (a) rejecting the commonly used ordering of the scale for *even* in terms of likelihood of *p* and its alternatives (i.e. requiring that $p <_{\text{likely}} q$) suggested in e.g. Karttunen and Peters 1979, Rooth 1992 and adopted in many other studies, e.g. Lahiri 1998, Chierchia 2013, Erlewine 2018). This rejection is based on data showing that $p <_{\text{likely}} q$ is neither a necessary condition for the felicity of *even* (Cf. in e.g. Kay 1990, Herburger 2000, Gast and van der Auwera 2011, Greenberg 2016) nor a sufficient condition on it (cf. Greenberg 2016). (b) an intuitive proposal in Rullmann 2007 that the prejacent of *even*, *p*, and its alternatives correlate with degrees on a contextually scale and (c) tools from the work on comparative correlatives in Beck (1997), which enable a precise formulation of this intuition:

(26) A gradability-based presupposition for *even* (Greenberg 2015, 2018)

Where *x* is a non-focused element in *p*, and *G* is a contextually supplied gradable property. For all contextually relevant focus alternatives to *p*, *q* in *C*, distinct from *p*:

$\forall w1, w2 [w1Rw \wedge w2Rw \wedge w2 \in p \wedge w1 \in [q \wedge \neg p]] \rightarrow$

$[the \max (\lambda d2. G(d2)(x)(w2)) > the \max (\lambda d1. G(d1)(x)(w1))]$ (**scalar ordering**)

$$\wedge \text{ the max } (\lambda d1. G(d1)(x)(w1)) \geq \text{standard}_G] \text{ ('evaluativity')}^9$$

In words, the presupposition has two parts: (a) A ‘scalar ordering’ requirement that the degree of a non-focused element in p (e.g. Bill in (25a,b)) on the contextually supplied scale G (e.g. height / success / suitability for a basketball team, etc.) is higher in the accessible p worlds than in the accessible q -and-not- p worlds and (b) an ‘evaluativity’ requirement that in both types of worlds the degree of this element is at least as high as the standard on that scale. For example (25a) (*Bill is even 175m. tall*) presupposes (a) that Bill’s degree of tallness (or suitability for the team, etc.) is higher in the accessible worlds where he is 1.75m tall than in those where he is 1.70m tall and not 1.75m and (b) that in the latter kind of worlds Bill’s degree of tallness is at least as high as the standard, i.e. that he is considered tall when he is 1.70m tall (and of course also when he is 1.75m).

Let us turn back now the interaction between *only* and *even* in (24). In (24a), the presence of *even* in Bill’s first sentence (*You even got higher than me, then*) presupposes that that both getting an A+ and getting an A are at least as high as the standard on the relevant scale, e.g. of success, i.e. both are considered successful. Crucially, then, if mirativity / evaluativity was also hardwired for *only*, i.e. if *only* indeed presupposed that its prejacent indicates ‘less than the standard’ we would wrongly predict it to be infelicitous in (24) due to a clash with the opposite presupposition of *even*. In reality, though, it is perfectly fine.

The same point can be illustrated by the felicity of *only* in (24b). The presence of *even taller than me* indicates that both 1.85m and 1.83m are considered *pos tall*, i.e. at least as high as the standard of tallness. This is supported by the fact that adding “I am short” to this sentence would be infelicitous, but will immediately improve if we remove *even*. The felicity *only* in (24b), then, means that it cannot indicate that its prejacent is ‘below the standard’.¹⁰ More generally, this data seems to show that unlike *even*, evaluativity or mirativity (in this case presupposing ‘less than the standard’) should not be hardwired into the semantics of *only*.

Notice that if indeed mirativity / evaluativity is not hardwired into the semantics of *only*, we would still need to explain why we so often do get a ‘less than expected / the standard’ effects when *only* is present, and why *only* is sometimes infelicitous when p indicates a degree which is ‘higher than expected / the norm’ (as in (19)-(21)) above. I will propose a way to indirectly derive these effects in in

⁹ See Greenberg 2017 for a more elaborated version of the presupposition, designed to handle cases where two different standards are salient in the context (e.g. introduced by two contrastive topics).

¹⁰ One could still try to argue that although *even* in (26) presupposes that being 1.83m tall is *pos tall*, i.e. at least as high as the standard, *only* can still indicate that this degree is not *pos tall*, i.e. below the standard if we accommodate two different standards here (a high one for the sentence with *even* and a low one for the sentence with *only*). There is no independent reason, though, to assume the presence of two standards here.)

section 5 below (based on ideas in Krifka 2000 and on the **hybrid** entry of *only*). Before that, however, let us turn to another reason for rejecting a mirativity-based explanation of the infelicity of *only* in (10a-d).

2.3.3 Mirativity / evaluativity is not a sufficient condition for the felicity of *only p* either

We suggest that mirativity is not only not a necessary condition for the felicity of *only p*, as shown above, but that it does not seem to be a sufficient condition either. Thus, even if we do hardwire some sort of a mirativity constraint into the semantics of *only*, it does not seem to be enough for explaining the infelicity of *only* in (10a-d). This point can be illustrated in felicity contrasts as in (27a,b):

- (27) a. (Context: The average number of children is 4). John has 2 kids. Bill *only* has #3/1.
 b. (Context: How many papers did your faculty members write during the last 5 years?)
Let's see: Susan wrote 15 papers, Ann wrote 15 as well, Sam wrote 14, Henry wrote 12, Tom wrote 11, Ted wrote 9, Ann wrote 9 as well, Ian wrote 4, and Bill (#only) wrote 5

In (27a) both the infelicitous and felicitous uses continuations (*Bill has 3 kids* and *Bill has 1 kid*) are those where *p* indicates a quantity which is lower than what is expected / the average / the norm (having 4 kids). That is, what makes *only* then, is not breaking the mirativity / evaluativity constraint. A similar case is seen in (27b), but rather the presence of a weaker alternative (*Bill has 2 kids*). Here the prejacent *Bill wrote 5 papers* indicates a quantity which is clearly lower than most alternatives based on the previous sentences, and can easily count as 'less than expected / less than the average', 'less than the standard', etc.. Nonetheless *only* is infelicitous. What makes it infelicitous is the presence of one sentence with salient material, which leads to an weaker than the prejacent (namely *Bill wrote 4 papers*).

Given these observation, what leads to infelicity *only* in (10a-d) above, as well as in many of the sentences examined here does not seem to be a violation of the mirative nature of *only* (even if one does assume that mirativity is part of the semantics of *only*).

3. A 'hybrid' entry for *only* as deriving the infelicitous cases and as capturing the parallel infelicity with *even*

3.1 A local solution to the infelicity puzzle

How, then, can we explain what makes *only* infelicitous in (10a-d) and what stands behind the descriptive generalization in (12) (repeated here)?

- (12) A generalization concerning the infelicity of *only*: When the C sets has an alternative to the prejacent of *only, p*, constructed based on discourse salient material which is not stronger than *p*, *only* is infelicitous.

To do that Orenstein & Greenberg 2013, Ornstein 2016 suggest to simply augment the **scalar** entry of *even* (as in (7) above) with an explicit presupposition requiring that all ‘salient’ alternatives in C which are distinct from *p* are stronger than it, where ‘salient’ alternatives are taken to be alternatives constructed based on salient material. This is seen in (28):

$$(28) \lambda C. \lambda p. \lambda w: w \in p \wedge \forall q [q \in C \wedge q \text{ is salient} \wedge q \neq p] \rightarrow q >_s p. \forall q [[q \in C \wedge q >_s p] \rightarrow w \neq q].$$

This immediately derives the infelicity of *only* in (10a-d) above. Nonetheless in this paper I will take a different path. This has several reasons. First, the fact that the entry in (28) makes different requirements on different sets of alternatives – namely an assertion concerning all alternatives in C and a presupposition only over a ‘salient’ subset of C is unusual. Focus sensitive particles usually dictate a relation between *p* and a constrained set of alternative, and not different relations on different sets. Second, the solution suggested in (28) is rather descriptive – it is simply a way to phrase a bit more formally the descriptive generalization in (12), and it is ‘local’. In the next section we will see that the infelicity puzzle in (10a-d) and the generalization in (12) is part of a more general pattern in which *only* parallels *even*. The entry in (28) cannot capture this parallel. Finally, in section 6 below we will discuss cross-linguistic data regarding *even*-like and *only*-like particles which indicates that scalarity and exclusivity should be separated in the lexical entries of scalar particles. This weakens the desirability of the **scalar** entry of *only* like (7), of which (28) is a version, where exclusivity is a special case of the scalarity along entailment-based scale.

3.2 The parallel between infelicitous cases of *only* and *even*

An important observation we will rely on here is that the felicity conditions of *only* seem like an exact mirror image of the felicity conditions for *even*. In particular, and as seen in (29) and (30), *even* is perfectly felicitous in all of the original cases where *only* was bad, but when we swap the order of the preceding sentence and the prejacent *only* becomes felicitous and *even* infelicitous:

- (29) a. Bill wrote 5 papers this year. John (#only /even) wrote [6]_F
 b. Last year John collaborated with Susan and Ann. This year he is (#only/even) collaborating with [Susan, Ann and Henry]_F
 c. Bill won the bronze medal in the contest. John (#only / even) won the [silver medal]_F
 d. Last month John managed to interview the minister’s assistant. This month he (#only /even) managed to interview [the minister]_F
- (30) a. Bill wrote 6 papers this year. John (only / #even) wrote [5]_F
 b. Last year John collaborated with Susan, Ann and Henry. This year he is (only / #even) collaborating with [Susan and Ann]_F

- c. Bill won the silver medal in the contest. John (only / #even) won the [bronze medal]_F
- d. Last month John managed to interview the minister. This month he (only / #even) managed to interview [the minister's assistant]_F

Moreover, remember that in (27b) above we saw that for *only* to become infelicitous, it is enough that there is one weaker salient alternative than *p*, crucially, even if *p* is weaker than many other alternatives. We can now see the precise parallel of this situation with *even* in (31), where there is one salient alternative stronger than the prejacent:

- (31) (Context: How many papers did your faculty members write during the last 5 years?)
Let's see: Susan wrote 5 papers, Ann wrote 5 as well, Henry wrote 12, Tom wrote 10, Ted wrote 9, Sara wrote 9 as well, Ann wrote 15, Ian wrote 13, and Bill even wrote #14.

Thus, the generalization in (12) can be seen as just one part of a wider generalization, phrased in (32), regarding the correlation between the (in)felicity of *even* and *only* and the strength of their prejacent relative to alternatives based on discourse salient material:

- (32) A generalization concerning the (in)felicity of *only* and *even*:
- a. When the C sets has an alternative to the prejacent, *p*, constructed based on discourse salient material, which is not stronger than *p*, *only* is infelicitous.
 - b. When the C sets has an alternative to the prejacent, *p*, constructed based on discourse salient material, which is not weaker than *p*, *even* is infelicitous.

Now crucially, unlike the infelicity of *only* above (e.g. in (10a-d)) which as we saw above constitutes a puzzle and cannot be derived using commonly-used entries, the infelicity of *even* illustrated in (30a-d) and described in (32b) is easily derivable from its traditional lexical entry, namely (3) above, repeated here:

- (3) $\llbracket \text{even} \rrbracket^{\text{sc}} - \lambda C. \lambda p. \lambda w: \exists q \in C q \neq p \wedge q(w) = 1 \wedge \forall q \in C q \neq p \rightarrow p >_C q. p(w) = 1$

Assuming again that discourse salient material is used to construct alternatives to *p* in C (cf. again Fox & Katzir 2011, Katzir 2014), the infelicity of *even* in (30a-d) and in (31) is now straightforwardly explained, since in each of these sentences the C sets have an alternative stronger than the prejacent, so the scalar presupposition of *even*, requiring *p* to be the strongest alternative in C, fails.

3.3. A general solution to the infelicity puzzle: A **hybrid** entry for *only*

The ability of the classical entry for *even* to account for its infelicity in e.g. (30a-d) and (31), and the fact that this infelicity mirror images the infelicity of *only* in (29a-d) can now naturally lead the way to constructing a parallel entry of *only*, namely one which presupposes that *p* is the weakest alternative to *p* in C.

An entry for *only* which contains this presupposition is suggested in various works on *only*, e.g. Guerzoni (2003), following ideas in König 1991, Crnić 2012, Charnavel 2017, Grubic 2015, Liu 2017 (for the Chinese exclusive *jiu*,). In this paper I will concentrate on Guerzoni's 2003 proposed entry in (33). I henceforth call this entry here **hybrid**, as it includes both a scalar component – namely the scalar presupposition that p is the weakest alternative in C – and a non-scalar one – namely the assertion that all alternatives in C which are distinct from p are false (we continue to assume here that the truth of p is presupposed as well):

$$(33) \llbracket \text{only}_{\text{hybrid}} \rrbracket^{\mathcal{K},c} = \lambda C. \lambda p. \lambda w: p(w) = 1 \wedge \forall q \in C q \neq p \rightarrow p <_C q. \forall q \in C q \neq p \rightarrow q(w) = 0$$

Given this **hybrid** entry, the infelicity of *only* in (10a-d) above is now straightforwardly derived in an exact parallel fashion to the derivation of the infelicitous cases of *even* in (30a-d): Here too the infelicity is due to the failure of the scalar presupposition, this time requiring p to be the weakest alternative in C , namely due to the presence of weaker alternatives there.

Moreover, given this entry of *only* and the parallel with the entry of *even* we can now predict that there will be cases where the felicity contrasts between these two particles will disappear, so **both** will be infelicitous. A case like this is where there will be one discourse salient alternative stronger than the prejacent of *only* and *even*, and one weaker than it. As can be seen in (34a-d), the prediction is borne out:

- (34) a. *Henry wrote 7 papers this year. Bill wrote 5 papers and John (#even/#only) wrote [6]_F*
 b. *Two years ago John collaborated with Susan, Ann and Henry. Last year he collaborated with Susan, and this year he (#even / #only) collaborates with [Susan and Ann]_F*
 c. *Henry won the gold medal in the contest, Bill won the bronze medal and John (#even / #only) won the [silver medal]_F*
 d. *Two months ago John interviewed the prime minister. Last month he interviewed the minister's assistant and this month he (#even / #only) managed to interview [the minister]_F*

To conclude, the **hybrid** entry of *only* in (33) naturally captures the infelicity of this particle in sentences like (10a-d), as well as the fact that this infelicity parallels that of *even* in (30), and the fact that in some situations *only* will be as infelicitous as *even*. This seems like a good motivation to prefer this entry over the popular **non-scalar** and **scalar** entries, which do not capture these facts.

In sections 5 and 6 I look at two more indirect motivations for adopting the **hybrid** entry. Before doing that, though, let us examine a challenge for this entry, having to do with the universal quantification over alternatives in C in its scalar presupposition. Importantly, here too we will see that the behavior of *only* parallels that of *even*.

4. Universal quantification over alternatives and the construction of C with *only* and *even*

4.1. An issue for the universal quantification in the scalar presuppositions of both *only* and *even*

A central feature of the **hybrid** entry in (33) is that its scalar presupposition involves universal quantification over the alternatives to *p* in C: ALL such alternatives must be stronger than *p*. As we saw above the motivation for this universal quantification is cases like (27b), where it is enough that one salient alternative in C is weaker than *p* to be make *only* infelicitous, even if all other alternatives are indeed stronger than it.

But one may wonder whether this universal quantification is not too strong. This is because in some of the examples we looked at *only* is perfectly felicitous although we could easily imagine contextually relevant alternatives in C which are weaker than *p*. Consider for example the sentences in (35):

- (35) a. *John won the gold medal. Bill only won silver*
 b. *John solved 8 questions in the exam. Bill only solved 6*

In both (35a) and (35b) there seem to be potential alternatives weaker than *p* which are very relevant in the context, and hence seem to be part of C, namely *Bill won the bronze medal* in (35a), and *Bill solved 5 problems* in (35b). If *only* indeed presupposes that *p* is weaker than ALL its alternatives in C we would wrongly predict it to be infelicitous in these sentences. In reality, though, *only* is perfectly felicitous.

Do such example indicate, then, that universal quantification is the wrong choice for the scalar presupposition of *only*?

4.2 The parallel with *even*: Keeping universal quantification and constraining C

To answer the question above it is important to observe that very similar kinds of doubts have been independently raised against the universal quantification over alternatives in the scalar presupposition of *even*, requiring *p* to be stronger than all alternatives in C. A well known example illustrating these doubts is (36), from Kay 1990, where *even* is felicitous although there seems to be a contextually relevant alternative stronger than *p*, namely *Mary made it to the finals* Kay 1990 took such examples to indicate that *even* does not presupposes *p* to be stronger than all alternatives, but only over a ‘context proposition’:

- (36) Not only did Mary win her first round match, she even made it to [the semifinals]_F (p. 89)

Other such examples can be easily constructed. (37a,b) with *even*, for example, are the mirror image of the example in (35a,b) above with *only*:

- (37) a. *John won the bronze medal. Bill even won silver*
 b. *John solved 8 in the exam. Bill even solved 9*

Here ‘winning gold’ and ‘solving 10 problems’ seem like contextually relevant properties, Nonetheless, *even* is felicitous although the alternatives based on these properties, namely *Bill won gold* and *Bill won 10 problems* are stronger than *p*.

Given the similar problem with universal quantification for the scalar presuppositions of both *only* and *even*, I suggest that any way to solve the problem with one of these particles should apply to the second one as well. There are essentially two such ways. The first is to try and abandon the universal quantification in the lexical entries of both particles, and use a weaker presupposition, e.g. a one which requires that *p* is stronger (in the case of *even*) or weaker (in the case of *only*) than a ‘context proposition’/ or than most alternatives. The second is to keep the universal quantification over alternatives in C, but to assume that the set of alternatives C is constrained in a similar way with *only* and *even*.

I think the first option should be given up, as it fails to account for the cases where the presence of even one alternative which is weaker than *p* (as in (27b)) or stronger than it (as in (31)) is enough to makes *only* and *even* infelicitous, respectively. The second option, in contrast, seems to have a better potential to account for the parallel balance between felicity and infelicity of *even* and *only* in the range of examples examined so far.

We will assume, then, that the scalar presuppositions for both particles compare the prejacent *p* to ALL alternatives in C, requiring *p* to be stronger than all such alternatives in the case of *even*, and weaker than them in the case of *only*, and that the set of contextually supplied alternatives in C is constrained in a similar way for both particles.

How to characterize precisely the constraints on C is a hard question that I not be able to fully answer here. We can point out, however, some preliminary general directions in doing so.

4.3 Some directions and challenges in defining the appropriate constraints on C

Given the data above it seems that at least in some cases discourse salient material has a priority over real world knowledge or over the lexicon, which can be ‘ignored’, or more technically be left out of C, when alternatives based on discourse salient material are present. This conclusion can be more clearly illustrated when examining the felicity contrasts in the minimal pairs in (38) with *even* and in (39) with *only*:

- (38) a. *Bill won bronze in the competition. John even won silver*
- b. *Henry won gold in the competition. Bill won bronze, and John (#even) won silver*
- (39) a. . *Bill won gold in the competition. John only won silver*
- b. *Henry won bronze in the competition. Bill won gold and John (#only) won silver*

Starting with *even* we can see that if both lexicon /real world knowledge as well as discourse salient material were contributing to the construction of alternatives in an equal way, the C set for (38a) would be as in (38a):

(40) Assumed C for (38a): { *Bill won bronze*_{discourse}, *Bill won gold*_{real world knowledge}, *Bill won silver*, }

But then, the scalar presupposition of *even*, requiring *p* to be stronger than all alternatives in C would fail, thus wrongly predicting that *even* to be infelicitous in (38a), just as its counterpart in (38b). This seems to indicate that the actual C for (38a) is (41):

(41) Actual C for (38a): { *Bill won bronze*_{discourse}, ~~*Bill won gold*_{lexicon}~~, *Bill won silver*, }

A similar reasoning can be applied to (39a) with *only*, where assuming a C set as in (42) with both lexically and contextually supplied alternatives would lead to failure of the scalar presupposition (requiring *p* to be the weakest alternative) and would that wrongly predicts *only* to be as infelicitous as (39b):

(42) Assumed C for (39a): { *Bill won bronze*_{lexicon}, *Bill won gold*_{discourse}, *Bill won silver*, }

Here too, then, we will assume that in the actual C set the alternative based on discourse salient material has a priority over the one based on the lexicon, i.e. that the former but not the latter are part of C:

(43) Actual C for (39a): { ~~*Bill won bronze*_{lexicon}~~, *Bill won gold*_{discourse}, *Bill won silver*, }

Notice that if one assumes that the scalar presuppositions of *even* and *only* do not involve universal quantification, there is no need to assume the asymmetry between contextually and lexically supplied alternatives, i.e. we can keep the assumed sets in (40) and (42). However, if we take such a move the challenge of explaining the infelicity of these particles in (38b)-(39b) is back again. To explain **both** the felicity of *even* and *only* in (38a)-(39a), and their felicity in (38b)-(39b) we seem to need scalar presuppositions for *even* and *only* with universal quantification over constrained sets of alternatives, where alternatives based on discourse salient material must be part of C, whereas those constructed based on relevant real world knowledge or over the lexicon can be left out when these salient alternatives are present.

This suggestion, though, still needs to be further examined and refined, as can be seen from considering sentences like (43a,b):

- (43) a. *We had a great year. John won the gold medal, and Bill (who is usually very weak) even won the silver medal*
 b. *We had a lousy year. John won the bronze medal, and Bill (who is usually our top candidate and easily wins the gold medal) only won the silver medal*

In both (43a) and (43b) *even* and *only* are felicitous despite the presence of discourse salient material which leads to constructing alternatives stronger and weaker than *p*, respectively. That is, in both cases

John's achievements, salient in the discourse, are ignored, and Bill's achievements are only compared to his usual performance (which is also made salient in the discourse).¹¹

Another case where discourse salient material seems to be ignored when constructing alternatives is illustrated in (44a)-(44b):¹²

- (44) a. A: This year there were 10 problems in the exam. How many did John and Bill solve?
 B: *John solved 8 problem. Bill even solved 9.*
- b. A: This year there were more than 3 problems in the exam. How many did John and Bill solve?
 B: John solved 6 problems. Bill only solved 5.

In (44) *even* and *only* are felicitous despite the presence of the discourse salient material “ten problems” and “3 problems”, respectively, which could potentially lead to constructing the alternatives “Bill solved 10 problems” (stronger than *p* in (44a)), and “Bill solved 3 problems” (weaker than *p* in (44b)). In actuality, the prejacent of *even* and *only* seem to be compared to alternatives based on the discourse salient sentences *Bill solved 8 problems* and *Bill solved 6 problems*, respectively. In both cases, then, there are two alternatives which can be constructed based on discourse salient material, but only one of them ends up in C. Perhaps the alternatives which end up inside C are those based on sentences with parallel structures to the prejacent (i.e. include “solved N problems”), whereas those outside C are not. This direction, however, needs to be further examined and explained.¹³

Let us take stock. The examples above show that there is still much work to do to clarify the precise balance between the contribution of discourse salient material (of different types), lexicon, and real world knowledge to the construction of ‘relevant’ focus alternatives in C. This can be seen as a project of refining the general algorithm for constructing alternatives in e.g. Fox & Katzir’s 2011, Katzir’s 2014, and in particular the definition of allowable substitution for an expression X, which takes both the lexicon and salient constituents to be sources for substituting material for constructing

¹¹ Cf. Greenberg 2018 discussion of such cases with *even*.

¹² Still another challenging case is (i) with ‘sequence of *only*s’. In such a case, the prejacent of the second *only* can felicitously express a higher quantity than that of the prejacent of the first *only*:

(i) (The average number of children here is 5). John only has 2 children. And Bill only has 3.

It seems as though the presence of the *only* in the first sentence ‘shields’ it, and indicates that its prejacent does not need to be considered a ‘contextually relevant’ alternative. Thus, the prejacent of the second *only* should not be compared to it, but to another higher alternative. I leave investigation of such ‘sequence of *only*s’ cases to future research.

¹³ It may be useful in this respect to define some sort of ‘salience hierarchy’ (similar to what is characterized for conditions on givenness, anaphora or definiteness (cf. Wagner 2012, von Heusinger 2013) which will at least partly help explain which material ends up being used for constructing alternatives in C and which does not.

alternatives.¹⁴ Giving a full characterization of the constraints on C, then, requires thorough investigation which is beyond the scope of this paper. In the meantime, we will keep assuming that the lexical entry for both *even* and *only* has a scalar presupposition with universal quantification over alternatives in an appropriately constrained set C, where “appropriately determined” still needs to be made precise.

5. Deriving the potential mirativity / evaluativity effects of *only*, as well as their disappearance

5.1 How to derive the mirativity / evaluativity effects of *only*?

In section 2.3.2 above we argued that although *only* tends to trigger mirative / evaluative effects, indicating that *p* is lower than expected / than the norm, etc., it is debatable whether this mirativity / evaluativity should be hardwired into the semantics of *only*. This is mainly because of cases where these mirativity / evaluativity effects disappear, i.e. where *only* is felicitous although its prejacent does not seem to indicate in any reasonable way a degree which is lower than what is expected / than the relevant standard on the relevant scale, or when it even indicates a degree higher than these.

On the other hand, the tendency of *only* to trigger such mirativity / evaluative inferences is very prominent (“Everyone knows that *only* is evaluative” Alxatib 2013). How can these inferences be derived if mirativity / evaluativity is not hardwired into the semantics of *only*?

5.2 The scalar presupposition of *only* and the effects of accommodating alternatives into C

To answer this question we will rely here on the interaction between the scalar presupposition in the **hybrid** entry on *only*, requiring all alternatives to *p* in C to be stronger than *p*, and ideas in Krifka 2000 according to which “alternative propositions must be considered reasonable, or entertainable, at the current point in discourse” (p. 405).

Applying this idea to *only* has been already suggested in various forms in the literature (e.g. Beaver & Clark 2008, Winterstein 2011, Orenstein 2016, Liu 2017).¹⁵ Orenstein 2016, for example, who

¹⁴ More research is needed here to reconcile the data and suggestions above with at least two other related suggestions made in the literature. The first is the suggestion that the covert version of *only*, namely *exh* (cf. Chierchia et al 2013) is ‘blind’ to contextual information (e.g. Magri 2009, 2011, Spector 2014). The second is that in some cases contextually-based alternatives are ignored and lexically-based ones enter C for solving symmetry problems with *only* and with scalar implicatures (cf. Katzir 2014, Trinh & Haida 2015). In this respect it will be interesting to compare the priority of contextually supplied alternatives over lexically supplied ones seen in above with *even* and *only* to the priority given to contextual alternatives by children in calculating scalar implicatures (as reported in Barner et al 2011)), and in giving some conjunctive readings of disjunctions (cf. Singh et al 2016). Thanks to Roni Katzir (p.c.) for pointing out this connection.

¹⁵ cf. also Homer 2019 for the ‘smallness’ effect of *all* in some copular constructions (e.g. in *All that John ate is a banana*).

takes *only* to presuppose that all ‘salient alternatives’ to *p* must be stronger than it (see again section 3.1) writes:

In many cases the salient alternatives are not explicit in the context, but rather accommodated by the hearer....For example, upon hearing the sentence *Mary has only [three]F children* with no explicit context, the hearer accommodates that the speaker compares the prejacent to salient alternatives involving having more children, (e.g. *x has five or six children*), thus implying that having three children is considered not many. (Orenstein 2016, p. 51)¹⁶

I will now develop this line of thought, making use of the scalar presupposition in the **hybrid** entry of *only* and constraints on accommodating alternatives in C, and will add a novel support for it.

In particular, we will assume that in the null context the use of *only* necessitates the listener to accommodate alternatives into C. Following Krifka’s (2000) line of thoughts, such an accommodation indicates that such alternatives are contextually entertainable or reasonable and in some cases ‘expected’. This can be compared to the forming of implicit domain restrictions on quantifiers (*Everyone arrived*), which results in narrowing the domain of quantification to those entities which are relevant (cf. von Stechow 1994 on domain restriction and in particular discussions in Kadmon & Landman 1993 on domain widening as adding entities which were previously considered contextually irrelevant).

Now, given the scalar presupposition in the **hybrid** entry, all of the accommodated, and hence contextually relevant / reasonable / entertainable alternatives to the prejacent of *only, p*, must be stronger than it. Thus in such cases the prejacent of *only, p*, indeed ends up being considered less than what is reasonable / entertainable in the discourse, i.e. less than the relevant standard.

Moreover, when such an accommodation clashes with existing contextual assumptions about what is reasonable or entertainable we end up with infelicity. This is what happens with sentences like (21), repeated here, in a context where the average number of children is e.g. 3:

(21) *John (#only) has 8 kids*

We suggest, then, that the reason for the infelicity of (45) is not that there is a built-in requirement (e.g. presupposition) in the lexical entry of *only* that the prejacent is ‘less than expected’ or ‘less the standard’, but rather because the alternatives which must be accommodated in to C in this case are e.g. *John has 9 children*, *John has 10 children*, etc., which are supposed to be contextually relevant / reasonable / entertainable. This clashes with what we already assume to be contextually relevant / reasonable /

¹⁶ Liu 2017, who analyzes an evaluative inference of *jiu* (a particle in Mandarin Chinese similar to *only*) makes a similar proposal:

“....the context dependent expected value s_c (Kennedy 1999) should always be included in the restricted alternative set induced by *jiu*. Intuitively, this is plausible, since the restricted alternative set tries to capture the idea of alternatives under consideration (Krifka 2000), and the expected value seems to always qualify as one of them.” (p. 16)

entertainable concerning the number of children, namely that having e.g. 9 children is NOT contextually relevant / reasonable / entertainable.¹⁷

5.3 A novel support: Mirativity /evaluativity effects of *only* disappear when no accommodation is required

A novel support for the explanation above is the observation that the cases where mirativity / evaluativity effects of *only* are reported to disappear, e.g. cases like (22) and (23a.b) above repeated here, i.e. those where *only* is felicitous despite the fact that *p* is above expectations / the standard, are exactly those where there is discourse salient material (e.g. VPs) which can be used to construct stronger alternatives:

- (22) (Context: My mother and I are organizing a weekend for the whole family. We discuss the location where the families of my two sisters, Rina and Esti, will stay)
 Mom: Rina has four kids so she will stay in the this apartment. Esti has only three kids, so she can stay in the smaller apartment.
- (23) a. (The average score on the exam was B). John and Bill are checking their grades:
 John: Wow! I got an A+!
 Bill: You got better than me, then! I only got an A. Wow! I am so happy!
- b. (The average height for men here is 1.78m). *John is tall. He is 16 years old and already 1.85m tall. His 14 years old brother Bill is a bit shorter – he is only 1.83m tall*

We suggest that mirativity / evaluativity effects disappear in such cases exactly because, unlike what happens in the null context, here accommodating alternatives into C is not needed anymore: In such cases the speaker can exploit the discourse salient VPs (in the preceding sentences) for constructing the alternatives, and such alternatives can safely enter C since they are contextually relevant by virtue of being based on material which was salient in the discourse. Crucially, then, in such cases no assumptions about what is or what is not reasonable / expected in the context need to be made, so no ‘less than the standard / less than expected’ inferences arise.

5.4 Taking stock: *Only* as only a scalar antonym of *even*, not a ‘mirative’/ ‘evaluative’ antonym

I conclude, then, that mirativity or evaluativity of *only* (even in the wide sense, as being ‘less than the standard’) can be derived, and should not be hardwired into its semantics. In all its uses *only p* just

¹⁷ In a sense, then, the felicity difference between *John only has 3 children* and *#John only has 9 children* resembles the famous felicity difference between *Sorry I’m late, I have to take my dog to the vet* and *??Sorry I’m late, I had to take my giraffe to the vet*, where accommodation of the proposition “I have a giraffe” clashes with contextual assumptions. In our case, though, the infelicity is perhaps more prominent since we have to accommodate propositions into C, which by virtue of being a domain restrictions, is itself constrained to have only ‘relevant’ propositions as members.

presupposes that p is weaker than all its focus alternatives in C , which are either accommodated (thus indirectly leading to ‘mirativity effects’), or constructed based on salient material (thus allowing a ‘mirativity-free’ interpretation).

Notice that this conclusion makes *even* and *only* scalar antonyms just in terms of the scalar ordering between p and its alternatives, and not in terms of indicating a degree which is more than vs. less than what is expected or what the standard is. This conclusion, then, stands in contrast to views which take the two particles to be ‘mirative antonyms’, expressing ‘more than expected’ and ‘less than expected’, respectively (as expressed in e.g. the quote from Zeevat 2013 in section 1).

A more general implication of this conclusion concerns the relationship between the notions of scalarity and mirativity / evaluativity. The literature on *even* and *only* many times ties these notions together. So, for example, the mirativity or evaluativity of *only* is taken to be captured by what is labeled a ‘scalar presupposition’. However, given the discussion above the two notions should be separated: Having a scalar semantics, i.e. dictating a certain ordering between p and its alternatives on a scale, does not necessitate an element to be mirative / evaluative (or more generally – sensitive to standards). Thus, *only* is scalar, but not inherently sensitive to standards (i.e. not mirative or evaluative), while *even* is both scalar and evaluative, i.e. sensitive to standards.

A way to capture this picture is to keep the ‘gradability-based’ semantics for *even* suggested in Greenberg 2015, 2017, as in (26) above, repeated in (45a), with its two conjuncts, capturing scalar ordering (written before as $p >_c q$) and evaluativity, and write the scalar presupposition of *only* as mirror imaging just the first conjunct as in (45b), capturing the opposite scalar ordering (written before as $p <_c q$):

- (45) **Gradability-based presuppositions for *even* and *only*:** Where x is a non-focused element in p , and G is a contextually supplied gradable property:

For all contextually relevant focus alternatives to p , q in C , distinct from p :

- a. ***Even*** is defined iff $\forall w1, w2 [w1Rw \wedge w2Rw \wedge w2 \in p \wedge w1 \in [q \wedge \neg p]] \rightarrow$
 $[the\ max\ (\lambda d2. G(d2)(x)(w2)) > the\ max\ (\lambda d1. G(d1)(x)(w1))\ (\text{Scalar ordering} - p >_c q)$
 $\wedge\ the\ max\ (\lambda d1. G(d1)(x)(w1)) \geq standard_G]\ (\text{evaluativity})$
- a. ***Only*** is defined iff: $\forall w1, w2 [w1Rw \wedge w2Rw \wedge w2 \in p \wedge w1 \in [q \wedge \neg p]] \rightarrow$
 $[the\ max\ (\lambda d2. G(d2)(x)(w2)) < the\ max\ (\lambda d1. G(d1)(x)(w1))\ (\text{Scalar ordering} - p <_c q)]$

6. Taking a wider perspective: English *only* and *even* within the family of scalar particles cross linguistically

6.1 Indirect cross linguistic support for a **hybrid** entry of English *only*

Theories like Guerzoni 2003, 2011, Zimmermann 2014, Grubic 2015, Charnavel 2017, Greenberg & Orenstein 2016, Liu 2017, New & Erlewine 2018 reported parallels and shared properties of various *even*-like and *only*-like particles in different languages. Some of these theories suggested to view such particles as members of a wide family of scalar operators. Adopting a hybrid entry for English *only*, as suggested above, can allow us to take this particle as a member of this family of scalar particles as well. This is indirectly supported by two types of reports in this literature.

The first kind of reports concerns the existence of particles which are more flexible than *even* and *only* regarding the scalar ordering between p and its alternatives. As already mentioned above (see the quote from Zimmermann 2014 in section 2), in many cases such flexibilities have been pointed out in the context of Downward Entailing operators, where we can assume a single ordering between p and its focus alternatives which is reversed due to the scale reversing effects of the DE operators (see, e.g. Bliss 2010 on Blackfoot, Charnavel 2017 on French, New & Erlewine 2018 on Burmese). However, there have also been reports of ‘real’ flexible particles, i.e. those which can be used to express opposite ordering even in matrix or Upward Entailing contexts. One example is the particle *kapa*, reported in Grubic 2012 to present in both Bole and Ngizim, both are west Chadic languages. Grubic shows that while *kapa* has the effect of *only* in Bole (indicating that its prejacent is on the low endpoint), in Ngizim it is interpreted as *even* (indicating that its prejacent is on the high endpoint). Thus, Grubic claims, *kapa* can be uniformly taken to indicate that its prejacent, p , is at a scalar endpoints of the relevant scale, and it varies regarding the specific scalar endpoint. Another example of a ‘scalarly flexible’ particle is Russian *voobsce*, which is shown by Miashkur 2017 to be ambiguous between an *even* and an *only*, indicating that p is stronger and weaker than its alternatives, respectively.

Such particles can be taken to be unspecified with respect to the scalar ordering parameters, i.e. as to whether $p >_c q$ or $p <_c q$. Given the existence of such particles, we can take both *even* and *only* in English as members of this family of scalar particles as well, but ones which are specified along this parameter, *even* indicating $p >_c q$ and *only* indicating $p <_c q$ (cf. Zimmermann 2014). This can only be done, though, if we adopt entries of *only* and *even* which require such an ordering, as in the classical entry for *even* and, crucially, the **hybrid** entry of *only*. This cannot be done, though, if we adopt the **non-scalar** or **scalar** entries for *only*, which do not require such an ordering.

A second relevant report concerns the existence of scalar exclusive particles which do not indicate the same scalar ordering as English *only*. These include *even*-like particles, like German *auch nur* (E.g. Guerzoni 2003), Japanese *deka demo* (Nakanishi 2006), and Hebrew *bixlal* (Greenberg & Orenstein 2016), i.e. those which behave like *even* in terms of scalarity (requiring $p >_c q$) and like *only* in terms of exclusivity (requiring all distinct alternatives to p in C to be false) Another relevant particle is

Russian *voobsce*, which as shown by Miashkur 2018 is exclusive while, as noted above, is unspecified for scalar ordering, having both *even*-like *only*-like effects.

The existence of such particles is predicted if the parameters of scalar ordering on the one hand, and additivity vs. exclusivity on the other hand are separated, i.e. are independent components in the entries of scalar particles. Turning back to English *only*, we find that it is only the **hybrid** entry in which this independence of scalarity and exclusivity is found. In the **scalar** entry in (7) above (as well as in its revised version in (28), suggested in Orenstein & Greenberg 2013, Orenstein 2016), scalarity and exclusivity are not independent of each other, since exclusivity (e.g. the inference that no other individual arrived in *Only John arrived*), is derived as a special case of the scalarity of *only*, namely as excluding all stronger alternatives on an entailment-based scale (see again section 2 for a review). In the **non-scalar** entry no scalarity requirement is present at all, of course.

Adopting the **hybrid** entry of English *only*, then, can be taken to be preferable over these two more commonly-used entries also because this makes it easier to view this particle as a member of the family of scalar particles cross linguistically, e.g. as differing from particles like *auch nur*, *bixlal* and *voobsce* in just the specification of scalar ordering, and sharing with it an exclusive component.

6.2 *only* and *even*: Mirror images along additivity vs. exclusivity parameter as well?

Following insights in Guerzoni 2003 and Charnavel 2017 we can see that adopting a **hybrid** entry for English *only* and a classical entry for English *even* indicates that the two particles mirror image each other along two dimensions, namely along both the ‘scalar ordering’ and the ‘additivity vs. exclusivity’ parameters, as seen in (46) and (47):

(46) Specifications for the scalar ordering parameter for *even* and *only*:

- a. *Even*: $\forall q \in C \ q \neq p \rightarrow p >_C q$
- b. *Only*: $\forall q \in C \ q \neq p \rightarrow p <_C q$

(47) Specifications for the additive vs. exclusivity parameter for *even* and *only*:

- a. *Even*: $\exists q \in C \ q \neq p \wedge q(w) = 1$
- b. *Only*: $\forall q \in C \ q \neq p \rightarrow q(w) = 0$ I.e. $\neg \exists q \in C \ q \neq p \wedge q(w) = 1$

(46), then, captures the old intuition about the mirror imaged scalarity of *even* and *only*, while (47) captures Horn’s 1969 idea about the additivity-exclusivity mirror imaged relation between them, reviewed in section 2, namely that “*even* (like *also*) asserts what *only* presupposes and presupposes the negation of what *only* asserts” (Horn 1969: 106).

Notice, though, that the mirror imaged relation in (47) is problematic given claims in the literature (in e.g. Rullmann 1997, Lahiri 2007, Krifka 1995, Greenberg 2016) which doubt the additivity

of English *even*. Krifka 1991 and von Stechow 1991 for example, showed that *even* is felicitous when its prejacent contains *only*, whose exclusive assertion clashes with the assumed additive presupposition of *even*. This is seen in von Stechow's example in (48a). As can be seen in (48b), *also* is infelicitous in such a construction:

- (48) a. Some guests didn't dance with many partners. Bill even danced only with Sue.
(Stechow, 1991, 817)

b. Some guests didn't dance with many partners. #Bill also danced only with Sue
Rullmann 1997, 2007 and Lahiri 2008 show that *even* is felicitous when *p* and its alternatives are mutually incompatible, as in (49) and (50). Again, *also* is infelicitous in such cases:

- (49) (Context: The contest was great. Susie won the silver medal and...)
a. Hasiba even / #also won the gold medal. (following Lahiri 2008: 361)

- (50) (Context: A: Is Claire an [assistant]F professor?)

B: No, she's even / #also an [associate]F professor. (Rullmann 1997: 45)

Greenberg 2016 showed that the lack of the additive inference with *even* can be also seen with mutually compatible alternatives, as in (51)-(52), where unlike what would have happened with *also*, the sentence with *even* does not indicate that the second tool is made of any other material besides steel, or that John read any book besides book A:

- (51) (Seller to client): Both tools are strong. The one on the right is made of strong aluminum, and the one on the left is even / also made of [steel]F.
(52) (Context: Bill and John read difficult books). Bill read book B. John even / also read [book A]F. (Greenberg 2016, #(30b))

Notice that these cases can be still analyzed by assuming that *even* does have an additive presupposition, but one which is weaker than that of *also*, e.g. requiring there is an alternative which differs from *p* in both Contrastive Topic as well as focused material and which is true (e.g. that some individual different from Bill won another medal in (50), or that some other tool in the context is made of some other material in (52)) (cf. Francis 2018 and others). Such a 'weakened' additive presupposition, though, will differ from the additive presupposition triggered by 'real' additives like *also*, and will not to mirror image the exclusive assertion of *only*.

However, it is not even clear that *even* is additive in this weak sense, since, as pointed out by Greenberg 2016, the problems with the additivity of *even* are also found in cases with no potential Contrastive Topic variations. This is seen in (53), where *even* is felicitous when *p* entails its contextually salient alternative where no other alternative varying with CT is present. Notice that the true additive particle, *also*, is again infelicitous in such cases:

- (53) a. A: Did John read some of the books?
 B: He even / #also read [all]F of the books. (cf. Wagner 2015 example (33))
- b. A: We need a signature of a professor on this form
 B: Well, John is a professor. He is even / #also a [full]F professor.
- c. A: How was the exam? Did you pass?
 B: Yes. I even / #also [got 90]F.
- d. A: Did you get a medal in the competition?
 B: Sure. I even / #also got the [gold]F medal.
- e. The queen gave birth to a child. She even / #also gave birth to [a boy]F

These observations are indeed a challenge for the claim that English *even* is ‘scalar additive’ particle, i.e. that it triggers an additive presupposition which is a mirror image of the exclusive assertion of *only*. Further research should examine this issue more closely, as there are cases where additive inferences do seem to be triggered by the presence of *even*. It may be, though, that such inferences can be derived pragmatically (see e.g. Sabolzi 2018 for a suggestion. See also Zimmermann 2014 for a weaker additive presupposition for *even*, which requires an alternative to *p* to be in the context, without requiring it to be true).

In the meantime, though, we assume that *even* is unspecified with respect to the additivity vs. exclusivity parameter (cf. Greenberg & Orenstein 2016 on Hebrew *afilu*), i.e. that it has the entry in (54) instead of in (3) above:

$$(54) \quad //even//^{\mathbb{E}^c} - \lambda C. \lambda p. \lambda w: \forall q \in C \ q \neq p \rightarrow p >_C q. \ p(w) = 1^{18}$$

Notice that adopting such an entry for *even* should not be taken as an argument against taking *only* to have an exclusive assertion as in the **hybrid** entry. While this exclusive assertion indeed does not mirror image an additive component of English *even* (given the entry in (54)), it is a mirror image of an additive component in other *even*-like particles cross linguistically, e.g. Russian *daze* (Miashkur 2018) and Hebrew *af* (Greenberg & Orenstein 2016), which have been shown to necessarily trigger an additive presupposition (e.g. they are as infelicitous as *also* in sentences like (47)-(49) and (52)). Thus, the non-scalar assertion of the **hybrid** entry of *only* can be still taken as providing a specification of a relevant parameter for *only*-like and *even*-like particles, namely the additivity vs. exclusivity parameter.

6.3 Taking stock: English *only* and *even* within the typology of scalar particles cross-linguistically

Given our discussion above we can see that adopting the **hybrid** entry for English *only* allows us to include this particle, along English *even*, as a member of the family of scalar particles cross linguistically,

¹⁸ For simplicity I ignore here the ‘evaluative’ presupposition of *even*. See sections 2.3.2 and 5.4 above.

thus further strengthening a more unified ‘parametric’ view of such particles in natural language. A partial picture of this typology, concentrating on the parameters discussed above can be seen in (55):^{19, 20}

(55)

Particle ↓ ↓	Parameter →→	Ordering of the scale $p <_C q$ vs. $p >_C q$ (for all alternatives q in C)	Additivity ($\exists q \in C q \neq p \wedge q(w) = 1$) vs. exclusivity ($\neg \exists q \in C q \neq p \wedge q(w) = 1$)	‘Mirativity’ - sensitivity to standards
<i>Only</i> (English) /		$p <_C q$	Exclusive	UNSPECIFIED
<i>Even</i> (English) /		$p >_C q$	UNSPECIFIED	p and its alternatives indicate a degree higher than the standard on the relevant scale
<i>Daze</i> (Russian)/ <i>af</i> (Hebrew)		$p >_C q$	Additive	?
<i>Deka demo</i> (Japanese) <i>/auch nur</i> (German) <i>Bixlal</i> (Hebrew)		$p >_C q$	Exclusive	?
<i>Kapa</i> (West African)		UNSPECIFIED	?	?
<i>Voobsce</i> (Russian)		UNSPECIFIED	Exclusive	?

7. Conclusion and directions: What (and what doesn’t) make *only* a mirror image of *even*

We started this paper in Beaver & Clark’s words about *only* and *even*, repeated here:

In considering the meanings of *only* and *even*, one is tempted to say that they are, in some sense, opposites. Yet is hard to put one’s finger on the nature of this intuitive antonymy.We suggest that *only* and *even* might best be labeled PRAGMATIC ANTONYMS (p. 71)

Our main claim in this paper was that adopting what we called a **hybrid** semantics for English *only*, developed in e.g. Guerzoni 2003, allows us to “put our finger” on the nature of this intuitive antonymy and capture it semantically. Given this entry *only* has a scalar presupposition with universal force – requiring that p is weaker than ALL its focus alternatives in C (in addition to presupposing the truth of p)

¹⁹ See (26) and (45) above for a more elaborated characterization of the scalar ordering and evaluativity parameters using the ‘gradability-based’ presuppositions in Greenberg 2015, 2017.

²⁰ But see Zimmermann 2014 for claims against the mirror imaged relation of exclusives and scalar additives, based on data in English and Vietnamese, arguing that *even* is a general alternative-sensitive particle, which has more flexible association properties than *only*.

- and a non-scalar assertion requiring that all distinct alternatives to p in C are false. Adopting the view that *even* has a scalar presupposition requiring p to be stronger than all its focus alternatives in C , this **hybrid** entry of *only* gets closer to capturing the old intuitive observation that the two particles are scalar antonyms than by adopting more commonly used entries, such as **non-scalar** or **scalar** entries.

In contrast to this antonymy in terms of scalar ordering (between p and its alternatives in C), we claimed that *only* and *even* should not be considered antonyms along the mirativity / evaluativity parameter. This is because while *even* is indeed a real ‘evaluative’ particle, presupposing that p (as well as its alternatives) indicates a degree which is higher than the salient standard on the relevant scale (as suggested in Greenberg 2015, 2018), the apparent mirror imaged mirativity / evaluativity of *only* (indicating a degree below what is expected / the standard) is not hardwired into its semantics. Instead, we claimed, adopting the **hybrid** entry for *only* allowed us to derive the presence of such mirativity / evaluativity effects of *only*, as well as the absence of such effects, pragmatically.

In addition, we argued that *only* and *even* should not be considered antonyms in terms of exclusivity vs. additivity either. This is because although *only* has an exclusive assertion, *even* is not a true additive particle, and is instead unspecified for this parameter.

Concentrating on the part of the table in (55) above concerning English *even* and *only* can perhaps illustrate this picture better:

(56)

Particle ↓ ↓	Parameter →→	Ordering of the scale $p <_C q$ vs. $p >_C q$ (for all alternatives q in C)	Additivity ($\exists q \in C q \neq p \wedge q(w) = I$) vs. exclusivity ($\neg \exists q \in C q \neq p \wedge q(w) = I$)	‘Mirativity’ - sensitivity to standards
<i>Only</i> (English) /		$p <_C q$	Exclusive	UNSPECIFIED
<i>Even</i> (English) /		$p >_C q$	UNSPECIFIED	p and its alternatives indicate a degree higher than the standard on the relevant scale

The antonymic relation between *only* and *even*, then, concern the scalar ordering parameter (colored in gray), but neither the ‘exclusive vs. additive’ parameter, for which *even* is unspecified, nor the mirativity / evaluativity parameter, for which *only* is unspecified. As the title of this paper suggest, then, *only* is only a scalar mirror image of *even*, not a ‘mirative’ or ‘exclusive’ mirror image of it.

In addition for enabling a more precise characterization of the relationship between *only* and *even*, we argued that adopting the **hybrid** entry of *only* is supported due to its ability to account for the infelicity of this particle in the presence of discourse salient material which are weaker than the parallel material in its preadjacent, and for the fact that this infelicity is a mirror image of the infelicity of *even* in

the presence of discourse salient VPs stronger than the VPs of its prejacent. In contrast, we argued, neither the **non-scalar** nor the **scalar** entries of *only* can capture these infelicitous, not even if they are augmented with constraints on non-vacuity or mirativity / evaluativity (which we claimed should not be part of the semantics of *only* to start with).

Maintaining the universal quantification over alternatives in C in the scalar presupposition of the **hybrid** entry of *only* required us to also explain cases where *only* is felicitous despite the potential presence of relevant alternatives weaker than its prejacent provided by the lexicon or by real world knowledge. We emphasized, however, that precisely the mirror imaged challenge has been independently raised against the universal quantification over alternatives in C the scalar presupposition of *even*. We took this to further support the parallel scalar semantics of *only* and *even*, on the one hand, and their parallel sensitivity to constraints on C on the other hand (though we emphasized that these constraints should be further studied).

Finally, we showed that unlike the **non-scalar** and **scalar** entries, the **hybrid** entry of *only* allows us to more easily consider it as part of the larger family of scalar *only*-like and *even*-like particles cross linguistically, which differ along parameters such as scalar ordering, additivity vs. exclusivity, etc.

The claims and suggestions in this paper raise issues and questions beyond those which were already mentioned above, which can be taken up in future research. One direction is to examine to what extent the dimensions of the scale for *only* and *even* can be unified. In section 5.4 above we have already suggested a schematically unified scalar presupposition for both particles based on contextually supplied scales (building on Greenberg's 2015, 2018 'gradability-based' suggestion for *even*). This kind of scale seems to work well for 'rank order' readings of *only*, as in *John is only [a clerk]=F*), as well as for complement exclusion' readings (cf. Coppock & Beaver 2014), using entailment-based scales, as in *John only saw [mary]_F*, using entailment-based scales. From the other side of the coin, Liu 2017 observed the relevance of 'entailment-based' scales, usually leading to exclusive inferences with *only*, with *even*-like particles in Mandarin. More work should examine similarities and differences between the dimensions of the scales for *only* and *even* and for their correlates cross linguistically. A related target of investigation should be the (in)ability to accommodate 'reversed' scales with *even* (cf. Greenberg 2015, 2018) and *only* (cf. discussions in Klindinst 2004 and Winterstein 2011).

Another direction for future research concerns the table in (55), illustrating the way some scalar particles in several languages vary along parameters like scalar ordering, additivity vs. exclusivity and mirativity. This is, of course, a preliminary table, which in future research should be extended both vertically, adding additional scalar particles (e.g. both overt ones as well as covert ones like *exh* and *E* cf. Fox 2007, Chierchia et al 2011 Chierchia 2013), as well as horizontally, adding more parameters of

variation discussed in the literature, which have been already shown to be relevant for both *only*-like and *even*-like particles. Such parameters include the **dimension of the scale** (e.g. entailment-based vs. rank order etc. see e.g. . Giannakidou 2007, Tomaszewicz 2012, Coppock & Beaver 2014, Orenstein 2016), the **type of alternatives** (e.g. sum vs. atomic based, see Liu 2017, overt vs. covert based, see e.g.. Orenstein & Greenberg 2013, Orenstein 2016, Greenberg 2018, to appear, Erlewine 2018, Wiagned 2018, or ‘propositional’ vs. speech act based, see e.g. Elliot et al 2015, Iatridou & Tetevosov 2016, Daniels 2018), the **status of various components** in the lexical entry (assertive vs. presuppositional, see e.g. Guerzoni 2003, Charnavel 2017), **association properties** (with focus / with contrastive topics, see e.g. Wagner 2012a, Zimmermann 2014, Greenberg 2018, Francis 2018), etc. Having extended the table like this will eventually allow us to see which combinations of features are attested in natural languages and which are not, thus shedding more light on the relations between the various parameters.

Finally, the balance between the contribution of different type of material (discourse salient, lexicon, ‘real world knowledge’, etc.) to the construction of alternatives in C, discussed in section 4 above, should be further examined. A general question in this respect is whether the conditions for constraining C are fixed, i.e. identical across the board for all focus sensitive constructions, or vary and at least partly determined by the specific focus sensitive operators involved, which constrain the construction of C individually. For example, are there focus sensitive particles, besides *only* and *even* which are more / less sensitive to discourse salient material in the C sets of the focus alternatives to their prejacent? Put in other words, can the type of constraints on C be taken as an additional parameter along which focus sensitive particles differ?²¹

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²¹ A preliminary positive answer to this question seems to be suggested by existing reports about scalar particles which are infelicitous unless there is discourse salient material which can be used to provide alternatives to *p*. Examples of such particles are the *even*-like *bhii* (Hindi) and *incluso* (Spanish) reported in Schwenter and Vashisht 2000, *bixlal* (Hebrew, reported in Greenberg 2015, to appear), and *daze* (Russian, reported in Miashkur 2018). These contrast with *tak*, *hasta*, *afilu* and *voobsce*, respectively, which are felicitous even if such discourse salient material does not exist, so the alternatives can be accommodated into C.

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