

2002

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Elena Guerzoni  
MIT

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### Recommended Citation

Guerzoni, Elena (2002) "*Even*-NPIs in Questions," *North East Linguistics Society*. Vol. 32 , Article 10.  
Available at: <https://scholarworks.umass.edu/nels/vol32/iss1/10>

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***Even-NPIs in Questions***\*

Elena Guerzoni

MIT

**1. Introduction**

It is well known that Negative Polarity Items (NPIs) like *any*, *lift a finger* and *the faintest idea*, are grammatical in questions. However the class of NPIs appears to split into two sub-varieties when their effect on the interpretation of questions is taken into account: While questions with *any* and *ever* can be used as unbiased requests of information, questions with so called 'minimizers', i.e. idioms like *lift a finger* and *the faintest idea*, are always biased towards a negative answer (a problem first addressed in Ladusaw 1979). This paper presents an account of this rhetorical effect induced in yes-no questions by minimizers.

The analysis I will propose elaborates on Ladusaw's original appeal to general pragmatic principles linking the way a question is asked to the speaker's expectations concerning its answer. Specifically, I show that the rhetorical effect of y/n questions with minimizers is a consequence of presuppositions, which, in each utterance context, reduce the set of possible answers for the speaker to the singleton containing the negative answer. From the perspective of the hearer, the speaker's preference for a question associated with presuppositions of this sort is a signal of her bias towards the negative answer.

The distinctive property of minimizers that accounts for these presuppositions is, as already proposed in Heim 1984, that minimizers contain a silent *even*, while *any* and *ever* do not (contra Lee & Horn 1994). In other words, minimizers, but not *any*, are NPIs

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\* I am most grateful to Danny Fox, Jon Gajewsky, Martin Hackl, Irene Heim, and Utpal Lahiri for their generous comments and suggestions. My thanks also go to Klaus Abels, Sabine Iatridou and David Pesetsky and to the audience of NELS 32 for helpful discussion.

of the Hindi variety, which also involve *even* plus an expression referring to a lower scale-endpoint (see Lahiri 1998).<sup>1</sup>

One crucial ingredient of my proposal is Wilkinson's (1996) scope theory of *even*. The present paper shows that, once the scope possibilities of *even* in a question are taken into account, the bias follows from the semantics and pragmatics of questions.

This work reveals an additional advantage of this analysis in terms of scope, i.e. that it accounts, without any further stipulation, for certain otherwise unexpected presuppositions of questions containing minimizers and more generally of questions where *even* associates with the lower end-point of pragmatic scales (see Wilkinson 1996).

The paper is organized as follows: Section 2 presents the relevant empirical facts. Section 3 shows that the same bias of questions with minimizers is found in questions where *even* associates with expressions denoting the lower end-points of the relevant pragmatic scales. Section 4 illustrates how the presuppositions introduced by *even* in a question relate to those introduced by this particle in declarative contexts. Interestingly, when *even* associates with a scale lower end-point, the presupposition of the question is the same as the one found in negative contexts, although no overt negation is present in the question. In sections 5 and 6, I present my proposal. Specifically I will argue that an analysis in terms of scope predicts not only the bias of the questions under consideration, but also the peculiar presuppositions they come with. What will make this unified account available is that a simple and natural notion of possible answer to a question in a context is restricted to those propositions whose presuppositions are satisfied in that context. My concluding remarks will be in section 7.

## 2. A Brief Survey of the Facts

Questions that contain *any* and *ever* (like 1a and 1b) can be used as neutral requests of information.

- (1) a. Did *anybody* call?  
b. Has John ever been to Paris?

On the other hand, questions with minimizers come with what has often been described as a negative **rhetorical** flavor (Ladusaw 1979, Heim 1984, Wilkinson 1996, Han 1997). Consider the examples in (2).

- (2) a. Did anyone *lift a finger* to help you? negative biased  
b. Does John have *the least bit of taste*? negative biased  
c. Does Sue have *the faintest idea* of how hard I'm working? negative biased

In order to avoid confusion, a better qualification of these facts is needed at this point.

<sup>1</sup> Importantly Lahiri points out that Hindi questions with NPIs are biased as well.

It has recently become common practice to classify as 'rhetorical' those uses of questions whose purpose is different from seeking information. Within this practice, 'negative rhetorical questions' are only those questions whose force is not of an interrogative, but, for all intents and purposes, of a negative assertion (see, e.g., Progovac 1993, Han & Siegel 1996 and Han 1998).<sup>2</sup>

This notion of 'negative rhetorical question' does not suitably capture the rhetorical effect of questions like those in (2), as the presence of minimizers does not always prevent an information-seeking force altogether.<sup>3</sup>

Nonetheless, questions with minimizers are never neutral either. If not 'negative rhetorical', the flavor they come with is that of 'negative bias'. In fact, to the extent that these questions can be used to elicit information, they cannot be used *disinterestedly* do so (Ladusaw 1979, Ch. 8, p.188). The presence of minimizers is systematically felt to signal the speaker's expectation (/bias) for a negative answer.

Borkin 1971 illustrates this point by showing that questions like those in (2) are infelicitous in contexts where it is clear that the speaker is unbiased as for what the true answer would be like. Notice that their counterparts with *any* are, instead, fine. (3) illustrates this point.

(3) *Sue and I gave a party. Some friends had volunteered to help organize it. A few would come with me to do the shopping, others perhaps were going to help Sue cleaning the apartment. At the end of the party, I wanted to thank all those who helped, but I didn't know who, if anybody, helped Sue in the apartment while I was out. Therefore I asked Sue...*

- a. Did anyone give you any help?
- b. # Did anyone lift a finger to help you?

Given that judgments of this sort are quite solid, we can conclude that a minimizer in a question obligatorily signals the speaker's expectation of a negative answer, whether or not the question under consideration is also used to elicit information; *any* and *ever*, on the other hand, do not generate this flavor.

This work attempts to make sense of this difference.

### 3. *Even* in Questions

As mentioned above, my account of the bias of questions with minimizers will exploit Heim's (1984) stipulation that these items involve a possibly hidden *even*. Besides containing a covert *even*, minimizers like *lift a finger* clearly denote the low end-point of the contextually relevant pragmatic scale (cf. Horn 1989, 399).

Interestingly, the semantic effect of *even* in questions depends precisely on the position of its focus on the contextually relevant scale. When the focus is the lower end-point, the question has the same rhetorical flavor to it as questions with minimizers, when it's the higher end-point the question is, instead, neutral.

<sup>2</sup> However, notice that within the above mentioned previous tradition, i.e. in Borkin 1971, Ladusaw 1979 among others, the classification as 'negative rhetorical' was meant to merely indicate that the questions under consideration are felt to be biased towards the negative answer.

<sup>3</sup> I'd like to thank Klaus Abels for pointing out to me the importance of this clarification.

Consider, for example, a question like (4) uttered in a context where the relevant alternatives to the focused element (*add 1 to 1*) are various mathematical operations, which can be ranked on a scale of 'difficulty'. On such a scale, *add 1 to 1* is clearly the lower end-point and the question is felt to be biased.

- (4) Can you *even* [add 1 to 1]<sub>f</sub>? negative biased

On the other hand, if the expression associated with *even* denotes the higher value on that scale (as in 5), the question can be used as a disinterested request of information.

- (5) Can you *even* [solve this very difficult equation]<sub>f</sub>? neutral

Finally, when the position of the focus of *even* on a scale is still to be determined, the question is 'ambiguous' between a neutral and a biased reading, accordingly. This is shown in (6). (6a) is a biased question, if the relevant pragmatic scale in the utterance context is (6b). On the other hand, the same question is neutral, if Problem 2 is the higher end-point of the contextually relevant scale, as in (6c).

- (6) a. Can Sue *even* solve [Problem 2]<sub>f</sub>? ambiguous  
 b. < the most difficult problem, problem n, ..., Problem 2 > negative biased  
 c. < Problem 2, problem n, ..., the easiest problem > neutral

Notice that if we assume that minimizers involve a hidden *even*, the similarity between questions involving them (repeated below) and questions where *even* associates with the lower end-point of a scale, as in (4a) and (6b), is fully predicted.

- (2) a. Did anyone (even) *lift a finger* to help you? negative biased  
 b. Does John have (even) *the least bit of taste*? negative biased  
 c. Do you have (even) *the faintest idea* of how hard I'm working? negative biased

This is so because, as often pointed out, it is a property of the meaning of these idiomatic expressions that they always occupy the lower point of their respective scales. For example, in each context, the overt portion of *lift a finger* will denote the lowest value on a scale where different actions are ranked with respect to how helpful they turn out to be in that context.

- (7) < be the most helpful ...,  
 do the dishes and carry all the shopping bags,  
 drive the car and open the door,  
 open the door,  
 ....  
 lift a finger >

Given this, an account of the biased reading of questions like (4) with *even* will automatically extend to the systematic bias of questions with minimizers like those in (2). Sections 5 and 6 of this paper will propose such an account.

Before turning to this proposal, however, in the next section I will introduce into

the discussion one further puzzling correlation between the position of the focus of *even* on the relevant scale and the effect of *even* in a question.

#### 4. The Presuppositions of *even* in Questions

It is uncontroversial that *even* doesn't contribute to the truth-conditional aspect of meaning, but introduces a presupposition. The goal of this section is to find out what presuppositions are associated to a question when it contains *even*. Importantly, the result will depend once more on the position of its focus on the relevant scale (a problem previously addressed in Wilkinson 1996).

I will start by recalling some general known facts regarding *even* in declarative contexts before turning to the more complex case of questions. In affirmative declarative sentences the contribution of this focus particle is a 'scalar' presupposition (ScalarP, henceforth) (and an existential presupposition, which can be ignored here). Specifically, (8a) asserts (8b) and presupposes (8c):

- (8) a. Mary can even answer [this difficult question].  
 b. Assertion (p): Mary can answer this difficult question.  
 c. ScalarP: For any salient alternative *x* to this difficult question, it is MORE likely that M can answer *x* than that M can answer this difficult question i.e. *p is the LEAST likely among the alternatives.*

Let us suppose, in absence of evidence to the contrary, that we can treat this scalar presupposition as a logical presupposition. As a consequence, the function of *even* in a declarative affirmative sentence like (8a) is to introduce partiality in meaning in the following way:

$$(9) \quad \llbracket \text{even} \rrbracket = \lambda C_{\langle \text{st}, \text{D} \rangle}^4. \lambda p_{\langle \text{st}, \text{D} \rangle}: \forall q_{\langle \text{st}, \text{D} \rangle} [q \in C \ \& \ q \neq p \rightarrow q >_{\text{likely}} p]. p$$

According to this lexical entry, *even* is a two-place partial function that takes a contextually salient set of alternative propositions (C) and a proposition (p) and returns the same proposition just in case the following condition is satisfied: that p is the least likely proposition among the alternatives in C.

When we turn to negative sentences, however, *even* appears to introduce a different scalar presupposition. This is shown in (10).

- (10) a. Sue cannot even [add 1 to 1].  
 b. Assertion (not p): Sue cannot add 1 to 1.  
 c. ScalarP: For any alternative *x* to 'adding 1 to 1', that Sue can do *x* is LESS likely than that Sue can add 1 to 1. I.e. *p is the MOST likely among the alternatives!*

Surprisingly, the presupposition *even* seems to trigger in (10c) is that the proposition in its second argument position (p) is the most likely, rather than the least likely, among the alternatives; the opposite of what we just saw in (8). Since, as we will see below, the choice between these two presuppositions is not always determined by the

<sup>4</sup> C is the set of contextually salient alternative propositions (see Rooth 1996).

presence vs absence of an overt negation, it might be useful at this point to introduce two abbreviations: In the remainder of this paper I will refer to presuppositions that are typical of *even* in affirmative contexts (like (8c)) as **hardP** and to those that are typical of negative contexts (10c), as **easyP** presuppositions.

**hardP** = *p* is the least likely proposition among the alternatives  
**easyP** = *p* is the most likely proposition among the alternatives.

As things stand, the meaning for *even* given in (9) above predicts presupposition of the **hardP** kind, but doesn't suffice to account for **easyP** presuppositions. To resolve this ambiguity, two proposals have been made that I will recall here briefly.

K&P 1977 and Wilkinson 1996 suggest an analysis in terms of scope. Specifically they explain the presupposition in (10) as a consequence of the scope of *even* with respect to negation: if *even* has wide scope, our lexical entry in (9) captures this presupposition as well. According to this view the LF for (10a) is (11a). The resulting presupposition (11b) is equivalent to (10c).

- (11) a. LF:  $\text{even} [\text{Sue cannot} [\text{add } t \text{ to } 1]]_i$   
 b. ScalarP: 'For every contextually relevant alternative *x*, that *S* canNOT do *x* is MORE likely than that *S* canNOT add 1 to 1, i.e. *not p is the LEAST likely among the alternatives*  $\Leftrightarrow$  *p is the MOST likely*

Rooth 1985 proposes, instead, to stipulate a lexical ambiguity for *even*. According to this proposal there is one *even* which introduces the presupposition in (9), and a second *even* (*even<sub>NPI</sub>*) which introduces the opposite presupposition. The distribution of this second reading is confined to those contexts that typically license NPIs (negation, questions, etc.).

- (12)  $\llbracket \text{even}_{\text{NPI}} \rrbracket = \lambda C_{\langle \text{ST}, \text{T} \rangle} . \lambda p_{\langle \text{ST}, \text{T} \rangle} : \forall q_{\langle \text{ST}, \text{T} \rangle} [q \in C \ \& \ q \neq p \rightarrow q < \text{likely } p]$ . *p*  
 ScalarP: *p is the MOST likely among the alternatives.*

A detailed review of the arguments in favor and against each of these approaches is well beyond the scope of this paper. In what follows, however, I will endorse the scope theory, for reasons that will become clear at the end of this section.

We can now finally turn to our original question. What presuppositions does *even* trigger in a question?

In interrogatives, the presupposition *even* introduces appears to depend on the position of its focus on the contextually relevant scale. Specifically, each question with *even* falls under one of the following three categories: when the focus of *even* is the higher end-point, the question comes with a presupposition that is typical of affirmative utterances (i.e. **hardP**); when the focus is the low end-point, the presupposition is the one typically found in negative environments (**easyP**); finally, a question is 'ambiguous' if the position of the focus of *even* on the relevant scale is still to be established: It can be associated with a **hardP** or **easyP** presupposition, depending on the context.

An example of the first type is given in (13). *The hardest problem* is the higher point on the scale of problems ranked by difficulty, and the question comes with a **hardP**

presupposition.

- (13) a. Can Sue *even* solve [the hardest problem]<sub>i</sub>?  
 b. ScalarP: For any alternative problem x, it is MORE likely that S can solve x than that she can solve the hardest problem.  
p is the **LEAST** likely among the alternatives. (hardP)

No matter which of the two theories for *even* one adopts, this presupposition is expected, as there is no negation in (13a).

(14) shows a case of the second type: *add one to one* is the lower end-point of the scale, thus the presupposition in this case is **easyP**.

- (14) a. Can Sue *even* [add 1 to 1]<sub>i</sub>?  
 b. For any alternative x to 'adding 1 to 1', that Sue can do x is LESS likely than that Sue can add 1 to 1.  
p is the **MOST** likely among the alternatives. (easyP)

It's worth noticing that Rooth's lexical ambiguity hypothesis can easily account for the presence of an **easyP** presupposition in cases like (14a). This is so because, the one *even* which triggers this presupposition (i.e. 12 above), is expected to be licensed in (14a), by whatever factor licenses NPIs in questions. In addition, since the focus of *even* is the lower end-point, the other reading of *even*, which generates a **hardP** presupposition is pragmatically excluded. As we will see below, however, the ambiguity theory fails to predict the systematic co-occurrence of **easyP** presuppositions with the 'negative bias reading' of the question.

Finally, there is an ambiguity in (15a): This question can be associated with a **hardP** or **easyP** presupposition, depending on what is the contextually relevant scale.

- (15) a. Can Sue *even* solve [Problem 2]<sub>i</sub>? ambiguous  
 b. < problem 2, problem 5, problem 3, ....., the easiest problem >  
 ScalarP: For any alternative x, it is MORE likely that S can solve x than that Sue can solve Pr.2. p is the **LEAST** likely among the alternatives. (hardP)  
 c. < the most difficult problem, problem 3, problem 5, ..., problem 2 >  
 Scalar P: For any salient alternative x to Problem 2 it is LESS likely that Sue can solve x than that Sue can solve Problem 2. I.e. p is the **MOST** likely among the alternatives. (easyP)

*Interim Summary:*

In the last two sections, two aspects to the 'ambiguity' of questions with *even* emerged. First, these questions can be neutral or biased. Second, they can be associated with the presuppositions that are typical of affirmative or of negative sentences containing *even*. In both cases, how the ambiguity is resolved depends on the position of the focus of *even*

on the contextually salient pragmatic scale. Table 1 summarizes the relevant correlations.

Yes-no questions with <i>even</i> +	A: Lower end-Point	B: Higher end-point
Interpretation		neutral
Presuppositions		hardP

Table 1

Since in minimizers *even* associates to the lower end-point of a scale, a question hosting one of these items will be a question of type A, in table 1. The goal of this work is to understand the bias readings of questions of this type. However, an analysis that provides a unified explanation of both this rhetorical effect and of the unexpected presupposition of these questions (i.e. *easyP*) is clearly to be preferred to any account of only one of these two puzzling related phenomena. The remainder of this paper will show that, of the two above mentioned theories of *even*, the scope theory proves more suitable to the task: An explanation based on a single meaning for *even* (as in (9)) and the syntactic (scope) configurations in which it is interpreted accounts for both the presence of *easyP* and its co-occurrence with the rhetorical flavor.

### 5. Scope Ambiguity of Questions with *even*

If the scope theory of *even* is correct, the differences in table 1 above should be the effect of a scope ambiguity. In this section, I will begin by showing how, besides the expected *hardP* presupposition, this hypothesis predicts the possibility of an *easyP* presupposition in questions with *even*.

In confronting the task of deriving *easyP* presuppositions, we can start by pointing out that *easyP* would be the presupposition of the negative answer, if *even* was present in this answer and had wide scope over negation (the opposite scope relation would generate instead *hardP*).<sup>5</sup>

- (16) a. Q: Can Sue even solve [Problem 2]<sub>r</sub>  
 b. A: No, Sue cannot even solve [Problem 2]<sub>r</sub>  
 c. LF1: *even* [NOT Mary can solve [Problem 2]<sub>r</sub>] (even > not)  
     ScalarP: not p is the LEAST likely among the alternatives ⇔ *easyP*  
 d. LF2: NOT even [Mary can solve t<sub>1</sub> [Problem 2]<sub>r</sub>] (not > even)  
     ScalarP: p is the LEAST likely among the alternatives ⇔ *hardP*

<sup>5</sup> The careful reader has probably already noticed that (16b) doesn't seem to have a reading where negation has scope over *even*. The absence of this reading is due to the fact that English *even* is generally infelicitous in the immediate scope of negation, a restriction that has often been attributed to a Positive Polarity nature of *even*. Given this, an LF like (16d) should be ruled out. Notice, however, that I will not entertain the hypothesis that we can derive the above ambiguity between *hardP* and *easyP* presuppositions in (16a) from a scopal ambiguity of *even* in the answer (16b). Such a hypothesis of a scopally ambiguous answer to a scopally unambiguous question would be *per se* implausible. Instead, the analysis that will be presented below attributes the possibility of the two presuppositions of (16c) and (16d) to a scope ambiguity of *even* with respect to the trace of *whether* in the question, rather than relative to the negation in the LFs of the answers. Therefore, the restrictions on the LF occurrences of the English lexical item *even* under negation, that blocks (16d), will not affect it.

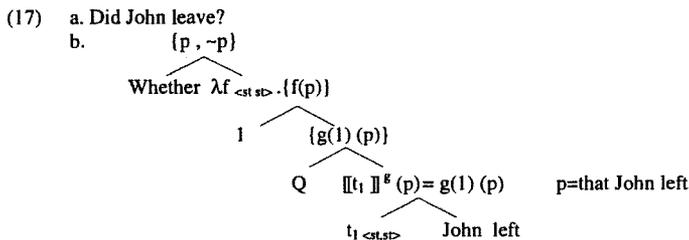
The task ahead of us consists in showing that the two different presuppositions are actually due to different scope options for *even* in the question (14a) itself. In other words, the proposal is that questions involving *even* are scopally ambiguous; under one reading they presuppose **hardP**, under the other they presuppose **easyP**.

In order to entertain this hypothesis we will need to make two assumptions here. The first assumption is that a *y/n* question always involves a hidden *whether*, (previous approaches based on this stipulation are Bennett 1977 and Higginbotham 1993).

In This paper I will take this silent *whether* to mirror other *wh*-words in its syntax and semantics. Within a Karttunen-style semantics of *wh*-words, this amounts to saying that *whether* denotes an existential quantifier.<sup>6</sup> Differently from the garden variety *wh*-words, however, *whether* quantifies over functions of type <st,st>,<sup>7</sup> and comes with an implicit restrictor: the set containing the identity ( $\lambda p.p$ ) and the negation ( $\lambda p. \sim p$ ) functions. This amounts to saying that *whether* means *which of yes or no*.

$$\llbracket \textit{whether} \rrbracket = \lambda f_{\langle \langle st, st \rangle \rangle} . \exists h_{\langle st, st \rangle} [h = \lambda p.p \text{ or } h = \lambda p. \sim p] \text{ and } f(h) = 1 \text{ } ^8$$

In the syntax, *whether* moves over the set-creating Q morpheme, leaving a trace of type <st,st> in its base position. The resulting denotation for a *y/n* question will be a Hamblin-set, namely the set containing the affirmative and the negative answer. It might be useful to see how this works for a simple *y/n* question like (17a).



<sup>6</sup> For the present purposes, it would be equivalently fine to adopt a Groenendijk and Stokhof (G&S henceforth)-style semantics of questions. According to G&S 1989 *wh*-words are taken to denote sets of individuals. For example *which student* denotes the set of students. Syntactically, *wh*-words always undergo movement, within this theory as well. In the semantics, this movement operation creates a  $\lambda$ -abstract that is composed with the denotation of the *wh*-phrase via Predicate Modification (PM).

If we extend this to *whether*, it will be sufficient to stipulate that *whether* denotes the set containing the identity and negation truth-functions (see (i)). This phrase also moves leaving a trace of type <t,t>.

(i)  $\llbracket \textit{whether} \rrbracket = \{\lambda t.t, \lambda t.\sim t\}$

The semantics works as in the other cases: The movement operation creates a  $\lambda$ - abstract over <t,t> functions that is composed with the denotation of *whether* via PM. I will leave as an exercise to the reader to verify that this option makes exactly the same predictions for the cases involving *even* as the semantics and syntax adopted above.

<sup>7</sup> The proposal that *whether* should denote a higher order quantifier of this kind is already in Bennett 1977. (Cf. also Krifka 1998).

<sup>8</sup> Compare with the Karttunen-style meaning for *who*:  $\llbracket \textit{who} \rrbracket = \llbracket \textit{which person} \rrbracket = \lambda P_{\langle e,t \rangle} . \exists x_e \text{ s.t. } x \text{ is a person and } P(x) = 1$

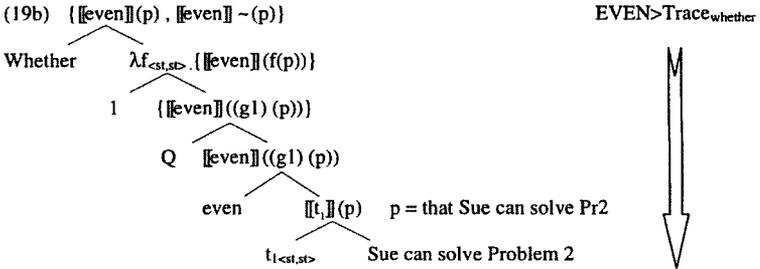


ScalaP: *That Sue can solve Problem 2* is the LEAST likely proposition among the relevant alternatives. **hardP**

- c.  $\llbracket \text{yes} \rrbracket = \llbracket \text{even} \rrbracket(\text{that Sue can solve Problem 2})$   
 ScalaP: *That Sue can solve Problem 2* is the LEAST likely proposition among the relevant alternatives. **hardP**

In (19a) *even* composes directly with the proposition *that Sue can solve Problem 2*. Therefore the presupposition it induces will be that this proposition is the least likely among the alternatives, no matter what value  $g(1)$  takes, i.e. no matter if we talk about the negative or the positive answer.

(19b) illustrates the semantic composition of (18b), the structure where *even* has wide scope with respect to the trace of *whether*.



- b.  $\llbracket \text{no} \rrbracket = \llbracket \text{even} \rrbracket(\sim(p))$  EVEN>NOT  
 ScalaP: The proposition *that Sue can't solve Problem 2* is the least likely among the alternatives.  $\Leftrightarrow$  **easyP**

- c.  $\llbracket \text{yes} \rrbracket = \llbracket \text{even} \rrbracket(\text{that Sue can solve Problem 2})$   
 ScalaP: *That Sue can solve Problem 2* is the LEAST likely proposition among the relevant alternatives. **hardP**

In this case the argument of *even* (i.e.  $g(1)(p)$ ) contains the variable denoted by the trace of *whether*. At the top node, after the application of the *wh-quantification-rule* *whether* has been quantified-in and this variable is bound by this existential quantifier; the resulting denotation for the structure is the set containing two partial propositions obtained by applying  $\llbracket \text{even} \rrbracket$  to the value of the identity or of the negation function applied in turn to  $p$  (i.e. *that Mary can solve Problem 2*):

$$\{\llbracket \text{even} \rrbracket(\lambda p. p)(\text{that Sue can solve Pr2}), \llbracket \text{even} \rrbracket(\lambda p. \sim p)(\text{that Sue can solve Pr2})\} = \{\llbracket \text{even} \rrbracket(\text{that Sue can solve Pr2}), \llbracket \text{even} \rrbracket \sim(\text{That Sue can solve Pr2})\}$$

As a consequence, in the case of negation, since  $\llbracket \text{even} \rrbracket$  applies to the already negated proposition, the presupposition it induces will be of the **easyP** kind, i.e. *that*

*Mary cannot solve Problem 2* is the least likely proposition among the alternatives, thus that *that Mary can solve Problem 2* is the most likely. This is shown in (20).

- (20)  $[[\text{even}]]$  (That Sue can't solve Pr2)  
 (i) is defined iff for every  $p$  in the set of relevant alternative propositions,  $p$   
 $>_{\text{likely}}$  that sue canNOT solve Problem 2.  $\Leftrightarrow$  **easyP**  
 (ii) if defined,  $[[\text{even}]]$ (That Sue can't solve Pr2) = that Sue can't solve Pr2.

To sum up, a scope ambiguity of the sort postulated above for a question like (16a), i.e. between the two LFs in (18), predicts the negative answers and the presuppositions of these two LFs to be those in (21b) and c, respectively.

- (21) a. Can Sue even solve Problem 2?  
 b. *no* answer to (18a) =  $\sim [[\text{even}]]$ (that S. can solve Problem 2)  
 ScalarP: **hardP**  
 c. *no* answer to (18b) =  $[[\text{even}]]$ (that Sue can't solve Problem 2)  
 ScalarP: **easyP**

*Interim Summary:*

Recall that our goal in this section was to make sense of the intuition that when *even* associates with the lower end-point of the relevant pragmatic scale in a question, the question comes with an **easyP** presupposition. Let's see how far we got in accounting for this phenomenon.

So far, I have merely shown how a scope theory of *even* predicts that one possible answer to these questions under one of their two readings ( $\text{even} > \text{trace}_{\text{whether}}$ ) is associated to an **easyP** presupposition. Since the presupposition of the other possible answer and of both answers under the other reading is **hardP**, this obviously doesn't suffice to account for the intuition that the question as a whole unambiguously presupposes **easyP**.

In fact, following Bennett 1977, we can conceivably take a question denoting a set of partial propositions to presuppose the disjunction of the presuppositions of these propositions. Given this, as things stand right now, the above analysis still yields the incorrect prediction that, no matter what is the position of the focused expression in the relevant scale, a question with *even* can have one of two presuppositions: i. **hardP**, under its surface scope reading and ii. **hardP** or **easyP**, under inverse scope of *even* with respect to the trace of *whether*.

In order for an **easyP** presupposition to be the presupposition of a question with *even*, one of the two readings (i.e.  $\text{trace}_{\text{whether}} > \text{even}$ ) and one of the answers to the other reading ( $\text{even} > \text{trace}_{\text{whether}}$ ) should be excluded, at the stage where the presupposition of the whole question is determined. Section 6 shows that this is precisely what happens in the cases where the focus of *even* is the lower end-point on the scale.

## 6. Presuppositions and Possible Answers in a Given Context

In the previous section we saw that the Hamblin set of a question with *even* contains only partial propositions, i.e. propositions whose felicity in a context will be restricted by the presuppositions introduced by *even*. We can make some speculations about how this affects the interpretation in a given context of a question containing *even*.

I will follow a tradition started by Stalnaker and view the context as the set of possible worlds in which all the propositions presupposed by the participants to a conversation are true. Since answers with false presuppositions are presupposition failures, it is reasonable to assume that a speaker uttering a question in a context  $c$  is biased towards those answers whose presuppositions are true in all the worlds in  $c$  ('true in  $c$ ' henceforth). This section illustrates in more detail how this effect comes about.

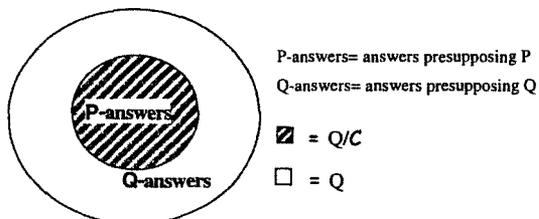
Let's call  $Q/c$  the subset of the Hamlin set  $Q$ , containing only those possible answers the speaker is presenting as live alternatives in a context  $c$ , i.e. the answers whose presuppositions are true in  $c$ . (See Heim (2001)).

On the one hand, when all the answers to a question have the same presuppositions only two options are possible:  $Q/c$  can be identical to  $Q$  or empty. The latter situation results in a presupposition failure. Consider the famous example in (22).

(22) Have you stopped beating your wife?

If the utterance context is such that the hearer has never beaten his wife,  $Q/c$  is empty and the question infelicitous. This is so because both its answers (and therefore the question itself) presuppose a proposition that is not true in  $c$ .

On the other hand, in cases where different elements in the Hamblin-set  $Q$  have different presuppositions, there will be also contexts (say  $C$ ) where the set of possible answers ( $Q/C$ ) is a proper subset of  $Q$ . For example, if some possible answers to a question presuppose  $P$  and others presuppose  $Q$  and if  $P$  is true in  $C$ , but  $Q$  is not, the situation will be as follows:



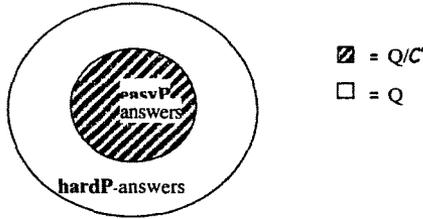
Given our considerations in the previous section, this is precisely the kind of situation we expect to find when *even* occurs in a question. What I will show now is that, in contexts of the sort just described, the question will come with a bias flavor towards the P-answers.

Consider once more our question (16a), repeated below. The utterance context has the important function of providing the information as to how high on a pragmatic scale the denotation of the focused expression (*Problem 2*) is ranked with respect to the relevant alternatives. The contexts that interest us, given our present purposes, are those in which *Problem 2* is very easy to solve, i.e. where *Problem 2* denotes the lower end-point of the scale (16b below).

(16) a. Can Mary solve even *Problem 2*?

b.  $C'$ : < the most difficult problem, .....,... Problem 2 >

In a context of this sort, a **hardP** presupposition is false and an **easyP** one is true, thus  $Q/C$  contains only **easyP**-answers.



This situation has two important consequences. The first consequence regards reading (18a) (trace *whether* > even) repeated here as (23a). Recall that under this reading both answers to the question presuppose **hardP**. Therefore, this reading is absent in  $C'$  because all its answers presuppose **hardP** and therefore would be infelicitous in  $C'$ . This is shown in (23).

- (23) a.  $\llbracket \text{Whether}_1 Q \text{ t}_1 \text{ even M. solved } [Pr2]_i \rrbracket = \{ \llbracket \text{even} \rrbracket(p), \sim \llbracket \text{even} \rrbracket(p) \}$   
 Since *Yes* presupposes **hardP**,  $\llbracket \text{yes} \rrbracket \notin \llbracket 23a \rrbracket / C'$   
 Since *No* also presupposes **hardP**,  $\llbracket \text{no} \rrbracket \notin \llbracket 23a \rrbracket / C' \rightarrow \llbracket 23a \rrbracket / C' = \emptyset$

The second consequence is that the set of those answers to the second reading (i.e. 18b, repeated in 23b) that are possible according to the speaker's presuppositions, i.e. the set  $\llbracket 23b \rrbracket / C'$ , contains only the negative answer. This is so because only this answer comes with a presupposition that is true in  $C'$ .

- (23) b.  $\llbracket \text{Whether}_1 Q \text{ even t}_1 \text{ M. solved } [Pr 2]_i \rrbracket = \{ \llbracket \text{even} \rrbracket(p), \llbracket \text{even} \rrbracket(\sim p) \}$   
 Since *Yes* presupposes **hardP**,  $\llbracket \text{yes} \rrbracket \notin \llbracket 23b \rrbracket / C'$   
 Since *No* presupposes **easyP**,  $\llbracket \text{no} \rrbracket \in \llbracket 23b \rrbracket / C' \rightarrow \llbracket 23b \rrbracket / C' = \{ \llbracket \text{even} \rrbracket(\sim p) \}$

The conclusion is that, in contexts where *even* associates with the lower end-point of the relevant scale, the question hosting it will be unambiguously interpreted under the wide scope reading of *even* and only its negative answer will qualify as 'possible':

Answers/ $C'$	Trace <i>whether</i> > EVEN	EVEN > Trace <i>whether</i>
Yes		
No		✓

Table 2

This accounts for both the puzzling phenomena related to questions of this type

that were discussed in the previous sections.

First, we can now understand why a question containing *even* is felt to be biased towards a negative answer, in contexts where the focus of *even* is the lowest scale end-point. If the speaker decides to formulate a question in a way that, given the context, excludes the possibility of an affirmative answer, he must be biased towards the negative one. Second, as the singleton of the possible answers in these contexts contains the answer presupposing **easyP** the question unambiguously presupposes **easyP** in them.

As mentioned above, the analysis presented here for questions with *even* extends automatically to minimizers. Recall that these items involve a hidden *even*. In addition, given their idiomatic nature, in every context, the overt portion involved in their structure denotes the lower end-point of the relevant pragmatic scale. As a consequence, the present proposal correctly predicts that these items will always enforce on questions a negative bias effect.

#### Conclusions:

In this section we have seen how a scope theory of *even* provides a unified account of both peculiar properties that questions with *even* exhibit in contexts where the focus of *even* is the lower end point of the scale. Let's see how Rooth's lexical ambiguity thesis copes with the same set of empirical observations. On the one hand, as noted above, this thesis correctly predicts that these questions have an **easyP** presupposition. On the other hand, however, it doesn't seem to make any prediction with respect to the bias effect of these questions.

In the contexts we are considering, the **hardP** presupposition is infelicitous, while the **easyP** presupposition is true. According to the ambiguity view, this simply means that the non-NPI meaning of *even* (in (9) above), which triggers **hardP**, is excluded; thus the only possible reading is the NPI one (given in (12) above), which triggers **easyP**. The choice of the NPI-*even*, which is licensed by whatever factor licenses NPIs in questions, does not predict the affirmative answers to be infelicitous, thus the bias effect remains unexplained.

Defenders of this view might object that this effect could be independent from the presuppositions triggered by *even*. Instead, they might argue, it is due, to one of the two following factors: the presence of an NPI (i.e. *even<sub>NPI</sub>*) or the presence of an expression denoting the lower end-point of a pragmatic scale. Recall, however, that the occurrence of an NPI in a question is not sufficient to force this effect: questions with *any* and *ever* can be used to disinterestedly elicit information.<sup>10</sup> Nor does the presence of expressions that contextually represent the lower end-point of a scale, by itself, account for the rhetorical meaning of the questions under consideration. In fact, the same questions, without *even*, when uttered in the same contexts are not biased. Compare the effect of (24a) with that of (24b), in a context where the relevant pragmatic scale is (24c).

<sup>10</sup> Notice that Han's 1998 explanation of the contrast between *any/ever* and *minimizers* in terms of strength does not seem to work either. She adopts Weak and Strong as Zwarts' 1996 and proposes that strong NPIs induce a bias effect in questions. Notice the, however, according to Zwarts' classification Strong NPI should be ungrammatical in contexts like (i), while minimizers are not:

- (14) a. Less than 3 students lifted a finger to help.  
 b. At most three students contributed so much as a dime.  
 c. At most 2 people had the slightest idea about what was going on

In addition to this problem, it is not clear how their 'strength' should explain the bias flavor of questions with minimizers.

- (24) a. Can Sue even solve Problem 2? biased  
 b. Can Sue solve Problem 2? unbiased  
 c. <the most difficult problem, problem n, ..., Problem 2>

On the basis of these considerations, the conclusion we can draw is that the facts discussed in this paper provide at least indirect empirical support for a scope theory of *even*.

**7. Conclusions, Problems and Open Questions**

This paper provided a unified perspective on two puzzling properties of questions with minimizers and, more generally, of questions with *even* and a focused expression denoting the lower point of the contextually salient pragmatic scale: A rhetorical effect and an unusual presupposition. Adopting Heim's (1984) hypothesis that NPIs of the above variety contain a hidden *even*, I argued that the two above properties follow from: the scope theory of *even* and very natural and simple assumptions regarding what should count as a possible answer in a context.

The above proposal makes, however, one, perhaps, undesirable prediction. The prediction concerns contexts where the focus of *even* denotes the highest scale end-point.

- (25) a. Can Sue even solve Problem 2?  
 b. c.: < Problem 2, problem 5, ..., the easiest problem >

In contexts of this kind, the question should be ambiguous between a neutral reading and a biased reading expressing the expectation of an affirmative answer. The biased reading should emerge under the wide scope interpretation of *even* relative to the trace of whether. Under this interpretation, the negative answer would come with an **easyP** presupposition that is not true and would therefore be excluded (as shown in table 3). This would leave only the possibility of an affirmative answer, a situation that should yield an 'affirmative biased reading'. The latter reading, however, is not attested.

<i>Even</i> + high scale end-point	NOT > EVEN	EVEN > NOT
YES	<b>Hard</b>	<b>HardP</b>
NO	<b>HardP</b>	<b>easyP</b>

Table 3

A theory of movement based on economy considerations, like for example Fox (2000), might provide an understanding as to why in these cases the biased reading is absent.

Recall that the only contribution of *even* is a presupposition. Therefore, in the spirit of a scope and economy theory of movement, movement of *even* should be licensed only when it generates new presuppositions. Notice, however, that in contexts where Problem 2 is very hard when compared to other contextually salient ones, the inverse scope of a question like (25) comes with the same presupposition as its surface scope reading: both ultimately presuppose **hardP**. This might be sufficient to prevent *even* from

moving, as this operation would not generate presuppositions of the question that are not already available before movement.

Before concluding, it's worth mentioning one more open question regarding the movement *even*. The option of movement over the trace of *whether*, I stipulated in this work, must evidently be excluded in the case of other scope bearing elements, e.g. quantifiers. This is shown in (26).

- (26) a. Did everybody come?  
 b.  $\sqrt{}$  [whether<sub>i</sub> [Q[ t<sub>1</sub> [everybody [came]]]]]  
 c. \* [whether<sub>i</sub> [Q[ everybody [t<sub>1</sub>[came]]]]] (neg. answer: Nobody came)

That a scope theory of *even* needs to assume that the movement of *even* is less constrained than XP-movement operations of a more familiar type, is a criticism that has often been brought into the debate by defenders of the alternative lexical ambiguity view. (Defenses of this position can be found, e.g., in Rullmann 1997 and in Barker Herburger 2001). Schwarz 2000 shows, however, that such an argument is not conclusive since there is a set of facts (presented first in Heim 1984) that only a scope theory seems to account for. The phenomena discussed in this work add one more case to Schwarz' list.

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Elena Guerzoni  
Department of Linguistics and Philosophy  
MIT,  
Cambridge, MA 02139

elenag@mit.edu