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Our even

Sabine Iatridou

MIT

E-mail: iatridou@mit.edu

MIT	Linguistics	and	Philosophy
77	Massachusetts	Avenue,	32-D808
Cambridge,		MA	02139
USA			

Tel: 617-253-2640

Sergei Tatevosov

Lomonosov Moscow State University and Moscow State Pedagogical University

E-mail: tatevosov@gmail.com

Department of Theoretical and Applied Linguistics

Faculty of Philology

Lomonosov Moscow State University

1, Leninskie Gory,

119991 Moscow

Russia

Tel. +7 495 9393256

Our even*

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I. A quick general background on *even* in declaratives and questions

The literature on the additive particle *even* is considerable. Since at least Horn 1969 and Stalnaker 1974, who observed that *even* does not affect the truth conditions of the sentence it appears in, and Karttunen and Peters 1979, who spelled out some of the non-asserted contribution of *even*, it is commonly assumed that utterances containing *even* have both an assertive and a presuppositional component.

For example a sentence like (1a) makes the assertion in (1b):

- (1) a. Even Lev came to the party.
- b. Lev came to the party.

In other words, the presence of *even* does not affect the assertion. Its contribution consists of two presuppositions:

- (2) The scalar presupposition:
Lev is the least likely person to go to parties or to this particular party.
- (3) The additive presupposition:
Somebody in addition to Lev came to the party.

The exact nature of the scalar presupposition has been debated. A common view is that the relevant scale is the scale of likelihood, as in (2), but a number of alternatives have been proposed in the literature (for example see Kay 1990 and Herburger 2000 for the notions of informativeness and noteworthiness; see also a recent proposal in Greenberg 2015). To be specific, we will assume for now that *even* comes with something like an unlikelihood scale and that its focus (*Lev* in (1a)) is the endpoint of the scale. However, scales involving alternative measurements should be compatible with what we say below as well, and therefore unlikelihood as such should not be seen as a necessary ingredient of our account (see also Section XI for qualifications).

On the other hand, there has been a bit of a debate as to whether the additive presupposition has an existence independent from that of the scalar/unlikelihood presupposition. Horn 1969, Karttunen and Peters 1979 and others take the position that an additive presupposition per se exists but von Stechow 1991, Krifka 1992, Rullmann 1997, and Wagner 2014 have cast doubt on this position. We will return to this issue in Section VI.

The appearance of *even* in questions has preoccupied the thoughts of many since Karttunen and Karttunen 1977. Consider the following question:

- (4) Did even Lev come to the party?

As expected, the additive and unlikelihood presuppositions remain: Somebody other than Lev came to the party and Lev is the least likely person to go to parties or to this particular party. But there are extra twists and turns that emerge when *even* appears in questions, in particular regarding the unlikelihood presupposition. Consider (5):

- (5) Can Mary solve even the hardest math problem?

Sentence (5), as expected, presupposes that the hardest problem is the least likely to be solved and therefore fits the unlikelihood presupposition as described so far. Take, however, a look at (6):

(6) Can Mary solve even the easiest math problem?

Sentence (6) does not presuppose that the easiest math problem is the least likely to be solved. On the contrary, it presupposes, as would be natural, that the easiest problem is the most likely to be solved.

This reversal in the presupposition of *even* from least likely (LL) to most likely (ML) in questions has generated an interesting debate (see among others Karttunen & Peters 1979, Rooth 1985, Wilkinson 1996, Rullmann 1997, Guerzoni 2004, Giannakidou 2007, Crnic 2011). Explanations of this reversal fall basically into two camps: the “Movement camp” and the “NPI camp”. According to the Movement camp (Karttunen & Peters 1979, Wilkinson 1996, Lahiri 1998, Crnic 2011 a.o.), the reversal from LL to ML is the result of *even* taking scope over certain types of sentential operators. When *even* has moved over such operators, its presupposition compositionally comes out as ML; when it scopes under them, as LL. According to the NPI camp (Rooth 1985, Rullmann 1997, Giannakidou 2007, a.o.) there are two *evens*: a LL *even* and a ML *even*. ML *even* is an NPI, so it will be licensed only in certain environments. NPI-*even* will not appear in sentences like (1), as NPIs are not licensed in affirmative declarative sentences. NPI/ML-*even* can appear in questions like (6), because questions are NPI licensing. In English, the two *evens* happen to be homophonous, but the NPI camp has received a boost from the fact that in some languages the two *evens* are associated with distinct lexical items. Rullmann (1997) mentions a number of languages which have a separate form for NPI *even*. Giannakidou (2007) explores various *evens* in Greek from this perspective and takes some of them to be NPIs.

We will not go further into the details of the different accounts in the two camps. The reader is referred to the sources cited. The main point that we want to take from this debate for now is that the focus of study of *even* in questions has so far been the possibility for the switch from “least likely” to “most likely” in its presupposition.

In this paper we will look at *even* in questions but we will look at a very different set of facts and issues.

II. Enter our *even*

Consider the following discourse:

- (7) A: Let’s meet at Oleana¹ for dinner. Is that OK?
B: Where is that even?

B’s utterance conveys that he knows nothing about Oleana. Not even where it is. We will refer to *even* in (7B) as ‘our even’² to distinguish it from garden variety unlikelihood *even*.

For now, we consider the diagnostic distinction between our *even* and garden variety unlikelihood *even* to be that our *even* comes with an inference of an epistemic nature, which can be described as the speaker being ignorant about the most basic thing about (an issue relating to) the Question Under Discussion³ (Roberts 2012, van Kuppevelt 1995a,b, 1996, Buring 2003). We will call this inference “inference of extreme ignorance”.

Our *even* cannot appear in declarative sentences. (8) lacks the inference of extreme ignorance:

- (8) Lev has (even) read Anna Karenina (even).

¹ Oleana is a restaurant in Cambridge, Massachusetts.

² For more on the naming of these uses of *even*, please see the conclusion.

³ The QUD does not have to be a question strictly speaking. It can be a topic.

Neither can our *even* appear in conditionals. The following are grammatical sentences but there is no inference of extreme ignorance.

- (9) a. If Lev has even read Anna Karenina, Mary will get him a gift.
b. If Lev has read Anna Karenina even, Mary will get him a gift.

It will turn out that our *even* can appear only in questions. In fact, it can appear in *wh*-questions, Y/N-questions and Alternative questions.

The goal of this paper is to offer an analysis of our *even*, addressing the obvious question of whether it can be reduced to garden variety unlikelihood *even*. We will start with *wh*-questions.

III. Wh-questions plus our *even*

Our *even* can be VP-adjoined or sentence-final⁴:

- (10) A: Shall we go to Oleana for dinner?
B: a. What do they even serve there?
b. What do they serve there even?
- (11) A: I want to study the Penutian language Tunica.
B: a. Where is that even spoken?
b. Where is that spoken even?

But it cannot appear on any other constituent. The mark “#” signals the absence of the inference of extreme ignorance:

- (12) #Where is even Oleana?
- (13) a. #What do even they serve there?
b. #What do they serve even there?
c. #Where is even Tunica spoken?

According to Kay 1990 and Wagner 2014, what the VP-adjoined position and S-final position have in common is that those are the two positions from which *even* can take sentential focus. Even though they reached this result on the basis of studying declarative sentences, we will assume that the same conclusion can be extended to questions.

Let us therefore quickly explicate what having “sentential focus” consists of. Following Rooth 1985 and others, the role of focus is to introduce alternatives. Take (1) (=14) again, where the focus of *even* is *Lev*. Consider a model where there are four children: Lev, Olivia, Lena and Miranda.

- (14) Even [Lev]_F came to the party

The associate of *even* is replaced by other elements in the domain, thereby generating a number of propositions, the focus value of (15):

- (15) a. Olivia came to the party.

⁴ Throughout this paper, we remain agnostic as to what the attachment site of the sentence-final *even* is.

- b. Lena came to the party.
- c. Miranda came to the party.
- d. Lev came to the party.

According to the unlikelihood presupposition, the propositions (15a-c) are more likely than the proposition with the associate of *even*, namely (15d).

Now let us look at an example where *even* has sentential focus (as opposed to NP-focus, as in (14)). Consider the following monologue:

- (16) A: a. Lots of strange things are happening this month...
 b. ...It has been raining every Thursday at the same time. ..
 c. ...Sue decided to be nice to me....
 d. ...[Harvard even held a pep rally last night]_F

The example is hopefully set up in such a way that it is clear that the alternatives to (16d) are (16b,c)⁵. In other words, when the focus of *even* is sentential, the alternatives, as expected, do not need to have any material in common with the sentence containing it.⁶

So we will assume that our *even* has sentential focus, which means that minimally the IP is focused. But what about the question-related material in the CP-area? That is, does *even* scope over or under the question operator and *wh*-word? (We assume that the question forming operator (Q) and the *wh*-word are in the same position in the sense that they cannot be scopally split apart by *even*.⁷) This means that sentential focus in a question should in principle permit two scopal possibilities at LF :

- (17) a. *even* [_{CP} Q+where is that]
 b. [_{CP} Q+where *even* is that]

There are a few reasons to prefer (17a) over (17b). For one thing, the meaning of (17b) would roughly be (18):

- (18) What is the location x such that “Oleana is at x” is the most unlikely proposition?

It does not seem that such a meaning is detectable⁸, and, furthermore, this is distinctly not the meaning of our *even*. On the other hand, (17a) seems to capture the intuition that the entire question

⁵ (16d) is provided as an example of sentential focus in Karttunen and Karttunen 1977, though given there without context.

⁶ In the words of Kay (1990), in examples like (16d), the scope and focus of *even* are *co-terminus*.

⁷ From a wider perspective, this assumption may be too strong. Pafel (1999), for example, discusses scopal interactions between *wh*-DPs and plain quantifiers and argues that a proper analysis of this type of phenomena may require a quantifier taking scope in between a *wh*-word and a question forming operator. However, at the case at hand, we have not found any evidence that assuming the structure [*wh* ... [*even* ... [Q ...]]] may be a promising way to go.

⁸ Why would it be excluded? It is not that obvious that we should go to any great effort to exclude it. It is possible that this is one of those cases where a reading is unavailable — or a sentence is ungrammatical — by virtue of its logical structure. See for example, Barwise and Cooper’s (1981) discussion of the unavailability of strong determiners in the existential construction, or von Stechow’s (1993) discussion of the unavailability of *someone except John*. See also Gajewski’s (2009) L-triviality, as well as Fox and Hackl (2006).

is in focus. Moreover, *even* has no problem scoping over certain sentential operators: the meaning of (19a) is as in (19b). So in principle it could be taking scope outside the Q-operator as well⁹.

- (19) a. Not even Lev came to the party.
b. It is even the case that Lev didn't come to the party.

Therefore, from now on we will adhere to the conclusion that our *even* focuses an entire question. If this is correct, then by common assumptions about *even*, this should mean that

- a) the alternatives are questions as well;
b) they are ordered on a scale of unlikelihood, or equivalent; and
c) the focus of *even* is (one of) the endpoint(s) of a scale.

Let us start with the last two points. Is it possible to check whether the focused question is the endpoint of a scale? Indeed it is. Compare the discourse in (20) with that in (21):

- (20) A: Let's meet at Oleana for dinner. Is that ok?
B: Where is that even?
B': What do they even serve there?

- (21) A: Let's meet at Oleana for dinner. Is that ok?
B: #What is the name of the chef even?

This contrast points to the possibility that the scale is one of unlikelihood of ignorance. In (20), the speaker conveys that even the most unlikely thing for her to be ignorant about with respect to Oleana she is ignorant about. What is the most unlikely thing to be ignorant about with respect to a restaurant? Obvious candidates are the restaurant's location or the type of food they serve.

On the other hand, (21) is odd and its oddness is due to the focus of *even* not being the least likely thing one can be ignorant about¹⁰. In other words, (21) violates the requirement of *even* to pick out the endpoint of an unlikelihood scale. That is, its oddness is like that of (22) when Max is an avid reader:

⁹ There can be a potential problem for this idea. In English, when *even* focuses an embedded sentence, it cannot appear inside it:

- (i) He told us many things about himself... He (even) said (even) [that he (#even) showers twice a day]_F

The same holds for *even* focusing embedded questions:

- (ii) He asked many things... He (even) asked (even) [who we (#even) vote for]_F

This raises an obvious question: if sentential focus *even* cannot appear inside its focus, would one not have expected the string in (iii) instead of that in (11)?

- (iii) *Even [where is that spoken]_F?

However, (iii) is ungrammatical. We do not know why (iii) is ungrammatical, but we do know that it fits a general pattern about the distribution of *even* and therefore is not really a problem for us. The general pattern is this: when *even* focuses an embedded declarative, *even* appears outside, not inside its focus; when *even* focuses a matrix declarative, *even* cannot appear in a sentence-initial position, but it can appear inside its focus. Unlike (16d), in (iv) *even* cannot have sentential focus:

- (iv) a. #Even [Harvard held a pep rally last night]_F

Similarly, when *even* focuses a matrix question, it cannot appear in a sentence-initial position, (iii), but it can appear inside its focus:

- (v) [Where is Tunica even spoken]_F?

We do not know what this pattern is due to. But what is relevant for us is that this larger pattern does not raise an obstacle to considering the LF representation of (1) to be that of (17a).

¹⁰ Though, a discussion among food critics could go this way.

(22) Even Max read the book.

Therefore, we can detect the presence of a scale with our *even* as well. Moreover, the intuition is: the scale is one of ignorance. This intuition is also supported by the fact that the conversational impact of our *even* is comparable to that of a straight-out assertion of (extreme) ignorance:

- (23) A: Shall we go to Oleana?
B: Where is that even?
B': I don't even know where that is.

So we see that a scale is involved in a sentence containing our *even* and that an endpoint needs to be picked. This gives hope that our *even* can be reduced to the known unlikelihood *even*.¹¹

To summarize, we have seen that our *even* focuses an entire question and that questions with our *even* appear to come with a scale of unlikelihood of ignorance. The lowest element of the scale is the one we are least likely to be ignorant about. In the next section, we explore the notion of ignorance and how it determines the ordering of the scale, which will be understood as a scale of questions.¹²

IV. Ignorance

So far we have been exploring our *even* in *wh*-questions. We have seen a number of manifestations of the parallelism between our *even* and garden variety *even*.

- Our *even*, like garden variety *even*, is a scalar particle.
- The ordering of elements of the scale is naturally described in terms of likelihood (or equivalent)
- Just like *even p*, when defined, denotes the proposition *p*, our *even Q* denotes the question *Q*.

Given the parallelism, a natural working hypothesis would be that our *even* is garden variety *even* which focuses an entire question. But there is also a point of divergence between our *even* and garden variety *even* that needs to be addressed for the hypothesis to be able to continue to stand.

So far we have the following two tenets:

¹¹ A question arises at this point: given the conversational impact of our *even* is that of ignorance, does it still contain a question? (7B) *looks like* a question, but is it interpreted as such?

Certainly, it can be answered:

- (i) — Let's meet at Oleana for dinner. — Where is that even? — It's on Hampshire street.

However, if all the speaker said was that she does not know where Oleana is, it could still trigger an answer from a cooperative interlocutor, just as a straight-out assertion of ignorance would:

- (iii) — Let's meet at Oleana for dinner? — I don't know where it is. — It's on Hampshire street.

However, (7B) seems to indeed be understood as a question, as can be shown by the possibility of A's following up as below (many thanks to Kai von Fintel for this test):

- (iii) — Let's meet at Oleana for dinner. — Where is that even? — Why are you asking that? Don't you trust me to take you somewhere nice?

Such a follow-up is not possible with an assertion of ignorance:

- (iv) — Let's meet at Oleana for dinner. — I don't know where it is. — #Why are you asking that? Don't you trust me to take you somewhere nice?

¹² One might wonder whether we should consider questions with our *even* rhetorical questions. Rhetorical questions are questions the speaker knows the answer to, and intends the answer to be inferred. For example, (i), from Han 2002, is meant to convey the inference in (ii):

- (i) What has John ever done for Sam?
(ii) John has done nothing for Sam

Could it be that questions with our *even* are rhetorical questions? The answer seems to be that they are not. First, the question *Where is that even?* does not bias towards the answer *nowhere*. Second, we characterized the sentences that we explored here as having an inference that the speaker is ignorant about the most basic thing about the QUD. This ignorance is incompatible with the speaker knowing the (positive or negative) answer to the rhetorical question. However, we will return in Section X to the issue of bias in questions with our *even*.

- (24) **Garden variety *even*** picks out the proposition that is least likely to be true of a list of propositions.
- (25) **Our *even*** picks out the question that we are the least likely to be ignorant about.

The distance between (24) and (25) is significant. We will attempt to change (25) to make the difference smaller. Specifically, instead of (25) we suggest (26):

- (26) Our *even* picks out **the question that is least likely to be asked (in context)**

That is, when it comes to ordering questions, the equivalent of ordering propositions in terms of (un)likelihood of being true, is ordering the questions in terms of (un)likelihood of being asked. The difference between garden variety *even* and our *even* is that the former involves the ‘less likely’ relation on propositions, while the latter exploits the same relation on questions. For propositions, the “less likely than” relation is conceived of in terms of the likelihood of being true in the evaluation world. We are assuming that the same relation on questions establishes an ordering according to the likelihood of being asked, given relevant facts in the evaluation world.¹³

One element of the scale is the focused question, an element that is (near) the endpoint of the scale. The other elements of the scale are alternatives to the focused question, hence, they are questions as well. What are those questions?

Let us take the original discourse about going to Oleana. There are a number of questions relating to Oleana which we will call “background questions” (and their answers the “background list”):

- (27) a. What is it?
 b. Where is it?
 c. What do they serve?
 d. How expensive is it?
 e. What is the atmosphere like?
 f. What is the service like?
 g. What is the name of the chef?
 h. Are the tables at an adequate distance to ensure privacy?
 i. ...

Therefore, the focused question is the endpoint of the scale on which background questions like those in (27) are arranged. This fact provides an understanding of how the inference of extreme ignorance comes about.

¹³ In fact, there may be a way of pressing further the shared expression of the semantics of garden variety *even* and our *even*. Floris Roelofsen (p.c.) suggests to couch both in terms of the likelihood of being *sincerely utterable*:

(i) In uttering “even ϕ ” a speaker conveys that among all the contextually restricted focus alternatives of ϕ , ϕ is the *least likely to be sincerely utterable*.

When applied to declaratives and questions, this gives us (iia, b):

(ii) a. When uttering a declarative sentence, i.e., making an *assertion*, sincerity amounts to knowing that the sentence is true.
 b. When uttering an interrogative sentence, i.e., asking a *question*, sincerity amounts to not knowing the answer to the question.

This further unification is certainly appealing but may be custom-made for *even* focusing matrix declaratives and questions. We will return to it when we discuss the issue of our *even* focusing embedded questions.

Our *even* picks out the question that is least likely to be asked (in context). Generally, questions give rise to the inference that a speaker does not know the answer. For example, when a question like (28a) is uttered, it is possible to draw the inference in (28b):

- (28) a. A: What is the capital of Bolivia?
b. A does not know what the capital of Bolivia is.

This inference is a conversational implicature because it is cancellable, as for example when a teacher or a quiz show host asks (28a)¹⁴.

With our *even*, the focused question is the question least likely to be asked, and in combination with the conversational implicature of ignorance, we derive the inference that the speaker does not know the answer to the question that is least likely to be asked.

In contexts where the aim of uttering a question is to obtain information, the likelihood of asking a particular question is reversely proportional to the likelihood of knowing the answer to this question (= the “asking-to-ignorance-link”)¹⁵. The more likely it is that the answer to a question is known, the less likely it is that the question will be asked. If we compute in the asking-to-ignorance-link, we derive the inference that the speaker does not know the answer to the question whose answer is most likely to be known. This way, we derive the ordering in terms of ignorance.

So what we have so far is captured in (29)-(35):

- (29) Utterance:
Where is that even?
- (30) LF Representation:
even [Q+where is that]_F
- (31) Presupposition:
‘Where is that?’ is the question that is least likely to be asked.
- (32) Conversational Implicature:
I don’t know [where it is].
- (33) Asking-to-Ignorance link:
The likelihood of asking a particular question is reversely proportional to the likelihood of knowing the answer to this question.
- (34) Compounded inference:
I do not know the answer to the question whose answer is the most likely to be known.

¹⁴ We are grateful to an anonymous reviewer who has suggested a specific way of deriving this inference, which relies on the assumption that a speech act operator is part of the derivation of a clause (see Krifka 2001, 2012, 2014, Hill 2007, Sauerland 2009, Charlow 2011, Sauerland and Yatsushiro 2014, Haegeman 2014, among others). QUEST, the speech act operator for interrogatives, comes with the presupposition that the answer to the question is not part of the common ground. One way to satisfy this is to project ignorance regarding the answer onto the speaker. That is, speaker-oriented ignorance is derived from the presupposition that the answer is not part of the CG. But as we said, this speaker-oriented ignorance is cancellable when a teacher asks a question. Even in the teacher scenario, however, the presupposition that the answer is not part of the CG remains.

¹⁵ If Roelofsen’s suggestion is right (see fn. 13), ‘sincere utterability’ would also capture the “asking-to-ignorance-link”.

- (35) Implicature of extreme ignorance:
I do not know the answer to any of the BQs and as a result cannot answer the QUD.

Therefore, the ordering of ‘least likely to be ignorant about’, which was the first intuitive way of capturing the meaning of our *even* in the previous section is not lost. But now it becomes derivative.

It is possible to make an indirect argument in favor of the following two points combined: the ordering is one of unlikelihood of being asked and the presupposition of unlikelihood of being asked remains even when the conversational implicature of ignorance is cancelled. Before proceeding, though, we should note that some speakers have difficulty with the crucial judgment, which is (36). We will make the argument based on the speakers who accept it. We do not know why there should be variation on this point¹⁶.

Imagine a classroom that has had as its focus of study for the last month the country of Bolivia. Students studied its history, geography, economy, music, political structure etc. After the month is over, the students are all quizzed on what they have learned. There is one particular student, Bobby, who does not seem to have learned anything. He cannot answer any of the questions the teacher asks. Exasperated, the teacher asks:

- (36) Bobby! Where is Bolivia even?

There is no inference that the teacher does not know where Bolivia is. That is, the conversational implicature of ignorance is not drawn. Yet, the inference that the location of Bolivia corresponds to the least likely question to be asked, remains.

This can also be seen by the infelicity of picking something that one is more likely to be ignorant about¹⁷:

- (37) #Bobby! Where is Bolivia’s 4th largest city even?

The strongest argument in favor of having the ordering being one of being asked is the improbability of our *even* bringing in a scale whose ordering is one of likelihood of ignorance. It is unclear how and why this could be a lexical property of our *even*. Nor is it clear how *even* can focus something that is not in the sentence itself but present only in a conversational implicature of that sentence. If, instead, the ordering is one of likelihood of being asked, we can relate the nature of the ordering to the nature of the focus of *even*, namely questions, as we saw earlier in the section.

V. Some technicalities

In the previous section, we have outlined the idea how our *even* and garden variety *even* can be reduced to the same semantic core. The goal of this section is to make this idea more technically precise. But before doing that, we would like to extend further the commonalities by pointing to

¹⁶ Manfred Krifka (p.c.) points out that in German, the relevant reading is easier to detect with stress on the verb.

¹⁷ This example is also useful in supporting the point that the ordering is one of unlikelihood of being asked, and that the intuition about unlikelihood of ignorance is derivative. If the ordering was one of ignorance directly, then in (7B) the ignorance would be the speaker’s and in (36) the hearer’s (namely, Bobby’s). We would have to postulate an index in the semantics, which sometimes would be bound by the speaker, sometimes by the hearer. We would have to formulate the conditions under which each can be the binder. If the ordering is one of unlikelihood of being asked, however, these issues can be avoided. Whose ignorance the implicature is about is determined contextually. This is not a knock-down argument of course, but it is suggestive.

some open questions that exist about garden variety *even*, and show that they transfer to our *even*, just as one would expect them to. We mention two such questions here.

There is a debate about whether the associate of *even* is less likely than *all* the relevant alternatives, or whether it is sufficient for it to be less likely than *most* (Kay 1990, Francescotti 1995). For example, in order to utter (1)(=38) felicitously, should Lev be *the* least likely person to go to a party or just less likely than most?

(38) Even Lev came to the party.

The same question can be asked for (7B)(=39):

(39) Where is that even?

Is it sufficient that *Where is that?* is one of the questions least likely to be asked? Or is it necessary that it be the single least likely one? We will not resolve this here. We merely mean to point out that the same issue arises for our *even* (7B)/(39), as for garden variety *even* in (1)/(38).

A second issue that comes up for garden variety *even* is the significance of the fact that it is felicitous even when the sentence that contains it appears to be already entailed. Consider the following discourse:

(40) a. Everybody came to the party. b. Even Lev came to the party.

After (40a), one would expect (40b) to be redundant, but it isn't. Why? One might say that (40b) does not feel redundant because somehow the common ground has not yet been updated with (40a) when (40b) is uttered. Or, the common ground has been updated but (40b) provides a widening of the domain on which *everybody* operates¹⁸. Whatever the reason, we see the same effect with our *even*:

(41) a. I know nothing about Oleana. b. Where is it even?

After (41a), the implicature of ignorance would be entailed, yet (41b) does not feel redundant. Again we can talk about suspension of update of the common ground or domain widening.

In short, our *even* has many similarities with garden variety *even*, including some open questions. We provisionally conclude then that there is nothing odd about our *even*. So far it appears to be nothing other than garden variety *even* which focuses an entire question, namely, the question that is least likely to be asked. The ordering of ignorance is derivative. This permits us to reduce the semantics of our *even* to that of garden variety *even*, except that the two will differ type-theoretically. This difference can amount to multiple lexical entries for *even* or to assuming that *even* is underspecified for type. We will not address this choice here but, as we will see in section XI, it has some further repercussions.

This having been said, we are turning to formulating the semantics of our *even* in the way where it maximally resembles garden variety *even*. Our *even* is a function of type $\langle\langle\langle\langle s,t \rangle, t \rangle, t \rangle, \langle\langle\langle s,t \rangle, t \rangle, \langle\langle s,t \rangle, t \rangle \rangle\rangle$. It takes a contextually relevant set of questions *C* and returns a partial identity function. The latter is defined only if its argument is the least likely question in *C*. When defined, the function returns the argument as its value.

¹⁸ Andersson (2006) argues, specifically, that *überhaupt*, the German counterpart of our *even* discussed in more detail below, is to be thought of as a domain widener. In addition, see Kay 1990 for an assuagement of the worry regarding (40).

- (42) $\llbracket \text{EVEN} \rrbracket^{w,g} = \lambda C_{\langle\langle s,t \rangle, t \rangle}. \lambda q_{\langle\langle s,t \rangle, t \rangle}. \forall q' \in C [q' \neq q \rightarrow q <_w q']. q$
 where $q <_w q'$ iff, given relevant facts in w , q is less likely than q' .

Take for example, a question with our *even* as in (43):

- (43) Where is Tunica even spoken?

Its LF is as in (44):

- (44) LF: $\llbracket [\text{even } C] [\text{where } [1 ? [\exists_e [\text{Tunica is spoken } t_1]]]]]_F]$

C , the first argument of *even*, identified earlier as the set of “background questions” (BQs), is required to be a subset of the focus value of the prejacent (Rooth 1985 and elsewhere).

- (45) $C \subseteq \llbracket [\text{where is Tunica spoken? }]]^f$

The focus value, $\llbracket [\text{where is Tunica spoken? }]]^f$, is obtained through replacing the focused element with elements of the same type. Since the entire question is focused, its focus value is the whole domain of questions, $D_{\langle\langle s,t \rangle, t \rangle}$. Recall that BQs form a subset of $D_{\langle\langle s,t \rangle, t \rangle}$ that contains Qs one needs to know the answer to in order to be in a position to address the QUD.

The derivation of (43) is shown in (46)-(53).

- (46) TP denotation¹⁹
 $\llbracket [_{TP} \text{Tunica is spoken } t_1]]^{w,g} = \lambda e. \text{Tunica is spoken in } e \text{ in } w \wedge e \text{ is at } g(1) \text{ in } w$
- (47) Existential closure
 $\llbracket [[_{TP} \exists_e [\text{Tunica is spoken } t_1]]]]^{w,g} = 1$ iff there is an e such that Tunica is spoken in e in $w \wedge e$ is at $g(1)$ in w
- (48) The $?$ -morpheme²⁰
 $\llbracket [?]] = \lambda p. \{p\}$
- (49) Proto-question formation
 $\llbracket [[? [\exists_e [\text{Tunica is spoken } t_1]]]]]^{w,g} =$
 $\{\text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } g(1)\}$
- (50) λ -abstraction

¹⁹ For simplicity we ignore issues surrounding habituality and genericity. We are also abstracting away from tense.

²⁰ Note that the $?$ morpheme is not a question speech act operator (SAO). Whether SAOs are part of syntactic and/or semantic derivation has been a topic of a number of recent studies (Krifka 2001, 2014, Hill 2007, Sauerland 2009, Charlow 2011, Haida & Repp 2012, Crnic 2013, Sauerland and Yatsushiro 2014, Haegeman 2014, to mention a few). If the system assumed here is extended to incorporate speech acts, a question SAO would come out as a separate piece of structure located outside what Krifka (2001) calls a question root, a semantic object created by the application of the $?$ morpheme. While we do not make this move here, we believe that our analysis will not change substantially if SAOs become part of the picture. Note, however, that we do not want *even* to take scope over a SAO. Focus alternatives to speech acts will be speech acts. In our *even* case, this would mean that the set of alternatives to a question with our *even* would include assertions, imperatives, etc., which does not seem to be semantically justified.

$\llbracket 1 \text{ ? } [\exists_e [\text{Tunica is spoken } t_1]] \rrbracket^{w.g} =$
 $\lambda x. \{ \text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } x \}$

(51) Semantics of *where*

$\llbracket \text{where} \rrbracket = \lambda Q_{\langle e, \langle \langle s, t \rangle, t \rangle \rangle}. \{ p: \exists x [\text{location}(x) \wedge p \in Q(x)] \}$

(52) Semantics of the question

$\llbracket \text{where } 1 \text{ ? } [\exists_e [\text{Tunica is spoken } t_1]] \rrbracket^{w.g} =$
 $\lambda Q. \{ p: \exists x [\text{location}(x) \wedge p \in Q(x)] \} (\lambda x. \{ \text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } x \}) =$
 $\{ p: \exists x [\text{location}(x) \wedge p = \text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } x] \}$

(53) $\llbracket [[\text{even } C] [\text{where } [1 \text{ ? } [\exists_e [\text{Tunica is spoken } t_1]]]] \rrbracket^{w.g}$ is only defined if

$\forall q \in C. \{ p: \exists x [\text{location}(x) \wedge p = \text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } x] \} <_w q.$

When defined:

$\llbracket [[\text{even } C] [\text{where } [1 \text{ ? } [\exists_e [\text{Tunica is spoken } t_1]]]] \rrbracket^{w.g} = \{ p: \exists x [\text{location}(x) \wedge p = \text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } x] \}$

In other words, we have been able to present garden-variety *even* and our *even* as quite similar in nature:

- Both can be analyzed as partial identity functions.
- Both take a contextually given set of alternatives as one of the arguments.
- Both presuppose that the prejacent is the least likely among the alternatives.

Does (53) suffice to derive the implicature of extreme ignorance? A negative answer could possibly be supported by the following reasoning: From the mere fact that the speaker asks the least likely question it does not follow that he is ignorant about the answers to other questions related to the QUD. Indeed, in (53), if there is no question in *C* other than *q* itself, the scalar presupposition will still be satisfied. At this point, the question whether our *even* comes with the additive presupposition starts being of significance²¹. We address this question in the next section. Before we get to it, we should point out a shortcut that we took in the current section. We proposed a compositional semantics for our *even* on the basis of the meaning of garden variety *even* and that of questions. In some languages, however, Russian, German and Hebrew among them, the lexical choice for our *even* translates as ‘at all’ in some other environments (see Section VIII for more cross-linguistic observations). This would require that we explore the scalar properties of this ‘at all’ item and show how its semantics (let’s say the semantics of “garden variety *at all*”), in combination with that of questions, yields the meaning that we have been focusing on in this paper. However, we will leave the relationship between *even* and *at all* for a future occasion and refer the reader to previous work on the investigation of this relationship, including that of Greenberg (2015, and work in progress) and Chierchia 2013, who argues that *at all* is accompanied by a covert *even*.

²¹ We are grateful to an L&P reviewer who encouraged us to discuss this issue.

VI. Our *even* and the additive presupposition

We saw at the beginning of the paper that garden variety *even* is commonly thought of as coming with an additive presupposition. From (1) there is an inference that there are other people besides Lev who came to the party. However, the independent existence of an additive presupposition has been doubted in, for example, von Stechow 1991, Krifka 1992, Rullmann 1997, Wagner 2014. At the opposite extreme, Lycan (1991: 130 *et seq.*) argues for a strong additive presupposition whereby all contextual alternatives to the focus of *even* have to be true.

The question we address in this section is whether we can detect the presence of the additive presupposition with our *even*, and if and how it contributes to the derivation of the implicature of extreme ignorance. Let's look at our original discourse again:

- (54) A: Let's go to Oleana for dinner. Is that ok?
B: Where is that even?

We said that the focus of *even* is the question *Where is that?* and that the alternatives are other background questions in (27) (*What do they serve?* etc.). So what would count as an indication of an additive presupposition in play? If it is that other questions have to have been explicitly asked, then we would have to conclude that there is no additive presupposition because none of the other background questions have to have been asked (remember that the QUD is not a background question). If this is the correct conclusion, then we could align ourselves with doubters of the additive presupposition, in particular with Wagner 2014, who argues that this presupposition can be absent in the case where *even* has sentential focus²². But this conclusion may be too fast.

There is another possible conception of the additive presupposition: it is satisfied by the background questions being *at issue*, or unresolved on the speaker's part (as opposed to having been asked, the alternative which we just rejected).

As we anyway saw, for the implicature of extreme ignorance to be derived, it has to be the case that there are unresolved questions about Oleana (other than the focused question itself) in the first place. In (54), C has to contain something other than just 'Where is that?'. To put it differently, something has to prevent the speaker from asking the least likely question marked as such by our *even* if all other questions have been settled. The additive presupposition would allow us to accomplish exactly this²³.

An obvious piece of evidence for the additive presupposition conceived of in the way just discussed, comes again from the parallelism with garden variety *even*. Consider (55):

- (55) a. Nobody else came to the party, but (#even) Lev did.
b. I know everything about Oleana except for one thing. Where is it (#even)?

To the extent that (55a) indicates that for *even* in (1) to be felicitous some alternative(s) to 'Lev came' have to be true, (55b) suggests something similar about our *even*. If the speaker knows the answers to every question pertaining to Oleana, a question with our *even* is illicit. We take examples like (55a-b) as an indication that the additive presupposition with our *even* is not less real than in the case of garden variety *even*.

²² While Wagner argues this on the basis of declaratives, it could be extendable to *even* having sentential focus over a question, as is the case with our *even*.

²³ However, this path faces some difficulties. We want to leave open the possibility for a complete unification between our *even* in questions and *even* focusing entire propositions, but it seems that for *even* to focus [Harvard held a pep rally yesterday], other propositions must have been, in fact, asserted or known to be true, not just alluded to.

A separate question is how strong the additive presupposition should be. A reviewer suggested that we may want to have the strongest possible variant in the spirit of Lycan (1991), who involves universal quantification over the members of the set of alternatives²⁴. Such a presupposition would indeed give us the maximal ignorance with no effort at all. By (53), the speaker asks the least likely question from the set of BQs. By the strong additive presupposition, all other BQs would also be unresolved. From this, via Asking-to-Ignorance link, it would follow that the speaker does not know the answer to any of the BQs.

However, there are doubts that the additive presupposition should be that strong, either for our *even* or for garden variety *even*. Guerzoni & Lim (2007) point out that Lycan's semantics falls short of accounting for examples like (56):

- (56) A: Who was at the party last night?
B: Well, some of the usual suspects were there, but not all of them, and yet even Eve was there!

Parallel examples can be constructed for our *even*:

- (57) A. How about having dinner at Oleana?
B. Well, I have heard of that place, but where is it even?
B' Well, I know the name of the chef and what they serve, but where is it even?

While (57) shows that not *all* BQs need to be unresolved, there is also reason to believe that the set of unresolved BQs cannot be too small. That is, the set of alternatives satisfying the additive presupposition should be of a certain size.

Imagine that out of 50 invitees, only three came to the party. Out of those three (or if you want, even out of all 50) Lev is the least likely to go to the party, yet he did. Even so, (58) is infelicitous:

- (58) Almost nobody came to the party but (#even) Lev came.

We can duplicate the situation exactly with our *even*:

- (59) I know almost everything about Oleana but where is it (#even)?

What these examples may indicate is that neither universal nor existential quantification over alternatives captures the content of the additive presupposition. One may be tempted to think that the desired result is achieved by employing a vague measure expression with the contextual standard of comparison like 'many'. We do not pursue this line of reasoning here, however. What is of significance in the context of the present discussion is: the amount of alternative propositions that have to be true in order to justify garden variety *even* seems to match the amount of questions that have to be at issue for our *even* to be licit and for the implicature of ignorance to be derived.

This having been said, we are in the position to discuss further discourse functions of our *even*.

VII. Further discourse effects

In this section we will examine two discourse effects of our *even*. The first one is its role in responding to the QUD; the second is its function as a presupposition-doubting response.

²⁴ Lycan makes universal quantification over alternatives part of the truth-conditional contribution of *even*.

Consider again the by now much discussed interaction about dinner at Oleana:

- (60) A: Shall we go to Oleana?
B: Where is that even?

We have already seen how speaker B conveys that s/he knows nothing about Oleana. However, B's response is also a felicitous response to the QUD. Why is that? The reason is that B has made a conversational move that is interpretable as her not being capable of answering the QUD. "I don't know where Oleana is" can end up contextually entailing "therefore, I do not know if I want to go there".²⁵

That B's response in (60) can be interpreted as an inability to answer the QUD is only a conversational implicature. It is possible to answer the QUD and still follow up with our *even*:

- (61) A: Do you want to go to Oleana?
B: Sure. We can go wherever you want. But I know nothing about this place. Where is it even?

In (61), B *does* answer the QUD. However, it is clear that the grounds for the answer are not based on any QUD-specific background list but on some larger (and irrelevant to the background list) principle, namely that B will go wherever A goes.

Note that B needs to flag that the basis of the decision is not the background list. A straight follow-up will not do:

- (61) A: Do you want to go to Oleana?
B: Sure. #Where is that even?

However, a *but* suffices:

- (62) A: Do you want to go to Oleana?
B: Sure. But where is that even?

The second discourse effect is that our *even* in questions can sound socially inappropriate in context. Compare Bobby's response in (63) with that in (64), where # is used for social inappropriateness:

- (63) a. Teacher: Bobby, do you know how to use a sextant?
b. Bobby: No. What is that?
- (64) a. Teacher: Bobby, do you know how to use a sextant?
b. Bobby: #No. What is that even?

²⁵ That there is such an inference can be diagnosed by the *let alone* test (Fillmore, Kay and O'Connor 1988, Toosarvandandi 2010):

- (i) A: Shall we go to Oleana?
B: I don't know [where that is], let alone [if I want to go there].

A propos of (i), we need to clarify a potential misunderstanding. We said that the focused question is ordered on a scale along with the other background questions from C. With (i) we are showing that there is a contextual entailment relation between the QUD and the focused question, via their implicatures of ignorance. But there is no transitivity here: We are not saying that the QUD is on the same scale with the background questions, that is, in C.

Bobby's response in (64b) does not sound appropriate within the social dynamic of a teacher/student interaction. Questions with our *even* sound overly familiar, and maybe even a challenge to the interlocutor. We would like to propose that this is the result of questions with our *even* having the discourse effect of a correction, specifically a presupposition correction²⁶.

There are felicity conditions on asking a question. These include the presupposition that the hearer should be able to answer the question. That is, (65) holds²⁷:

- (65) Answerability presupposition
When speaker S asks Q of hearer H, S presupposes that H is in a position to answer Q.

(65) captures the fact that one does not ask one's 13-year old daughter what the correct analysis of ACD is²⁸.

"To be in a position to answer" means to have a certain amount of relevant information that one can draw on to address the QUD. If not, S would not be asking Q of H. So when A asks (7A) of B, A presupposes that B has the relevant background information to draw on to answer the QUD. We already described this as the Background List:

- (66) a. Oleana is a restaurant.
b. It is on Hampshire street
c. We can get there on time
d. They serve Mediterranean food
e. It is not very cheap
f. The atmosphere is good enough
g. The service is good
h. ...

That such presuppositions are made can also be seen in different ways. For example, B can explicitly comment about A having made such a presupposition:

- (67) A: Shall we meet at Oleana for dinner?
B: Why do you think that I know where that is?

And the *The Wait a minute!* test works (Shanon 1976, von Stechow 2004):

- (68) A: Shall we meet at Oleana?
B: Wait a minute! I don't know where that is.

So when B answers *Where is that even?*, B corrects A on a presupposition that A had made. The particular presupposition that A had made was that B knew enough about Oleana to answer the QUD (the answerability presupposition). B responds with a question that implicates, in the manner that we have already seen, that he does not have minimal relevant information. This, in turn, signals

²⁶ This effect seems to be largely inescapable. Certainly in (64b) it is not cancellable. We do not know why this might be.

²⁷ An exception would be conjectural questions (see e.g. Littell, Matthewson and Peterson 2010).

²⁸ Consider also the minimal pair below, provided to us by Bob Stalnaker. When you do not know whether the person you are addressing knows what the final score was, you will tend to ask (i) rather than (ii). The answer to (i) is certain to be known by the interlocutor.

(i) Do you know who won the game? (ii) Who won the game?

that B cannot address the QUD on the basis of the Background List. This results in B correcting A's presupposition that B could have addressed the QUD. (64b) is thus awkward because students are not supposed to challenge teachers' background assumptions.

We can similarly explain the contrast between (69) and (70):

- (69) a. General: Soldier! Put the ammunition behind the shed.
 b. Soldier: Sir! Where is the shed, sir? (I do not know where the shed is, sir!)
- (70) a. General: Soldier! Put the ammunition behind the shed.
 b. Soldier: # Where is the shed even, sir? (#I do not even know where the shed is, sir!)

Imperatives can be felicitously used only if the action commanded can be in principle carried out by the hearer (Kaufmann 2012 and references therein). In other words, for the general to felicitously utter a command, he presupposes that the soldier can carry it out, which includes knowledge about the location of the shed on the background list. The soldier (inappropriately) corrects him on this presupposition.

If the above explanation for the status of (64b) and (70b) is correct, then one might wonder whether our *even* can be used to cast doubt on presuppositions in general. It definitely seems compatible with other presupposition-doubting moves:

- (71) A: All my colleagues have stopped smoking.
 B: (Wait a minute!) Who even smoked in your department?

But given that there is other presupposition-doubting material in (71B), it would be difficult to show the role of *even* in this result. What is definitely clear is that our *even* cannot be used to doubt assertions. This is shown in (72)-(73), though we need to borrow examples from our *even* in Y/N questions, to which we will get in a later section:

- (72) A: This animal is a mammal
 B: Are you sure it's a mammal?
 B': #Is it even a mammal?
- (73) A: Joan is here.
 B: Is he²⁹ really here?
 B':# Is he even here?

VIII. Our *even* in other languages

In Greek, Russian and German there is more than one *even* and there is a restriction on which one is used as our *even*. In Russian, garden variety *even* is *daže* but our *even* is *voobščē*:

- (74) Daže / *voobščē Džon prišel na večerink-u
 DAŽE / *VOOBŠČE John come-PST to party-ACC
 'Even John came to the party'
- (75) Eto voobščē / *daže gde?
 this VOOBŠČE / *DAŽE where

²⁹ This is Catalan *Joan*, a male name, and not the English female name.

‘Where is that even?’

In Greek, garden variety *even* is “akoma ke”, but our *even* is *kan*³⁰:

- (76) **Akoma** **ke/*** **kan** o Lev irthe sto parti
AKOMA KE/* KAN the Lev came to.the party
‘Even Lev came to the party’
- (77) Pu ine **kan/*akoma** **ke** afto?
where is KAN/*AKOMA KE this
‘Where is that even?’

And we see the same picture in German:

- (78) Sogar/*überhaupt Hans kam zu der Fete
SOGAR/*UBERHAUPT Hans came to the party
‘Even Hans came to the party.’
- (79) Wo ist das überhaupt/*sogar?
where is that UBERHAUPT/*SOGAR
‘Where is that even?’³¹

What is the significance of the fact that our *even* is different from garden variety *even* in some languages? In section I, we mentioned the debate that exists in the literature about what the proper analysis of LL (least likely) and ML (most likely) *even* is. Recall that according to the Movement camp, ML *even* has moved over sentential operators and according to the NPI camp, ML *even* is an NPI, a lexical item distinct from LL *even*. According to those two camps, if ML *even* takes a different form from LL *even*, it is because either the former is marked as a mover (or as having moved), while LL *even* is not, or it is an NPI, while LL *even* is not.

It would be natural to wonder whether the question of a separate form for our *even* should be connected to this debate. The Movement camp can claim our *even* as needing a sentential operator to move over, the question operator. For the NPI camp, the question of licensing is a bit harder. Our *even* appears in *wh*-questions and certainly *wh*-questions sometimes license NPIs:

³⁰ See Giannakidou (2008) for a broad discussion of several *evens* in Greek. It should be noted that some speakers only accept *kan* in Y/N questions, not in *wh*-questions.

³¹ Recently, Rojas-Esponda (2014) proposed an analysis of *überhaupt* that focuses on its role in a discourse strategy. For Rojas-Esponda, *überhaupt* marks a discourse move to an upper-level QUD. Her proposal bears certain similarities to ours. Most notably, both proposals agree that *even / überhaupt* can be used in questions challenging the answerability of a higher QUD or resolving the current discourse subtree. However, we do not see how Rojas-Esponda’s proposal is extendable to all the cases where our *even* appears: Among ascending moves defined in her paper, only *yes/no* questions are permitted. If our *even* marks ascending moves, and if ascending moves, when construed as questions, must be *yes/no* questions, we do not expect our *even* to occur in *wh*-questions at all. Yet, our *even* does appear in *wh*-questions as we saw, and so does *überhaupt*. Finding a way to incorporate our *even* in *wh*-questions into the view advanced by Rojas-Esponda may thus face difficulties.

For example in (i), it is not obvious what the superquestion is which B’s utterance comes to doubt or resolve:

- (i) A. Shall we meet at Oleana for dinner?
 B. Where is that even?

Nor is it clear whether the ‘extreme ignorance’ flavor that our *even* induces (most prominently, in *wh*-questions) is straightforwardly derivable from the assumption that it represents an ascending move in a strategy. Finally, without further elaboration, it is not immediately obvious if the analysis of *überhaupt* in *yes/no* questions extends straightforwardly to alternative questions, where our *even* can also appear (see fn. 43).

(80) Who here has ever been to Paris?

But if we wanted to place ourselves in the NPI-camp, we would not be able to appeal to this environment for licensing, given that we have argued that our *even* scopes outside the question. Alternatively, one might be able to appeal to indirect licensing in the sense of Linebarger 1987 or Horn 2013, given that (81a) implicates (81b), where *even* is in the scope of negation³²:

- (81) a. Where is that even?
 b. I don't even know [where that is]

However, it is actually unclear how our *even* interacts with the debate of LL /ML *evens*. For one, the forms our *even* takes are not always the forms of ML *even*. In Russian, ML *even* is *xotja by*, while our *even* is “voobšče”:

- (82) Maša mož-et reši-t' xotja by / *voobšče / ??daže prost-ejš-uju
 M. can-PRS.3SG solve-INF XOTJABY VOOBŠČE DAŽE simple-SUP-ACC
 zadač-u?
 math.problem-ACC
 ‘Can Mary solve even the easiest math problem?’

But there is an additional reason to doubt that our *even* is ML rather than LL *even*. ML interpretations come up in a proper subset of LL interpretations. And therefore, sentences that meet the conditions of ML are ambiguous between ML and LL interpretations. In (83), Mary can be the least likely or the most likely person to like (and correspondingly, Bill likes people very easily, or not easily at all).

(83) Does Bill even like Mary?

In the case of our *even*, there is no ambiguity. Therefore, we are probably not dealing with ML *even*³³.

Even so, the question of the choice of the lexical item for languages like German, Greek and Russian exists³⁴. We do not know why the particular choice is made in each language. Neither do we know if there is such a thing as a default form and whether any use of a form different from the default one has to be justified. But given that there is a lexical choice to be made, we are forced to say that in this paper, we only hope to be able to reduce the properties of our *even* to garden variety

³² However, if von Stechow (1997) is right that NPI-licensing ignores non-truth conditional components of meaning, a conversational implicature cannot license NPIs.

³³ There is an environment where ML is possible but LL is not, namely cases where the associate of *even* is lexically chosen so as to be pragmatically compatible only with ML, like *the easiest math problem* in (6). However, in the case of our *even*, there is no issue of lexical choice pragmatically excluding one reading.

³⁴ The question is reinforced by the fact that in Russian, Greek and German, the lexical item that is used for our *even* is also attested in other environments, and crucially, in such environments it behaves like an NPI. Moreover, in Russian and German (though not Greek) this item translates as ‘at all’:

(i) Lev voobšče ne čital “Devida Kopperfil’da”
 L. VOOBŠČE NEG read.PST D. C.
 ‘Lev did not read “David Copperfield” at all’

Voobšče in (i) and its counterparts in other languages are clearly part of the puzzle of cross-linguistic regularities in the lexical choice between garden variety *even*, our *even* and ML *even* (though recall that our *even* does not reduce to ML *even*, which is the one that has been claimed to be an NPI). However, in this paper we do not try to relate cases like (i) to the generalizations about our *even* established above.

even up to the point where the choice of lexical item matters. This will not be a complete reduction, therefore, because we will not address why certain lexical choices for our *even* will do while others will not. But it is the best we can do for now³⁵.

IX. Our *even* in Yes/No Questions

In this section, we explore the appearance and properties of our *even* in Y/N questions. Consider (84)-(86):

- (84) A: Is this creature a mammal, you think?
B: Is it even warm-blooded?
- (85) A: Shall we ask Joan to prepare something special for dinner?
B: Is Joan even here?
- (86) A: Did Olivia get the Fields Medal?
B: Is Olivia even a mathematician?

B's responses in (84)-(86) have several things in common with *wh*-questions with our *even*. In Greek, Russian and German, it is the same form as our *even* in *wh*-questions:

- (87) Ine **kan** edho o Yanis? Greek
is KAN here the Yanis?
'Is Joan even here?'
- (88) Vanja **voobšče** zdes'? Russian
V. VOOBŠČE here?
'Is Vanja even here?'
- (89) Ist Joan **überhaupt** hier? German
Is Joan UBERHAUPT here
'Is Joan even here?'

In addition, a straight-out profession of ignorance has the same conversational impact (compare B's responses in (84)-(86) with B's responses in (90)-(92)):

- (90) A: Is this creature a mammal, you think?
B'. I don't even know if it is warm-blooded.
- (91) A: Shall we ask Joan to prepare something special for dinner?
B'. I don't even know if he is here.
- (92) A: Did Olivia get the Fields Medal?
B'. I don't even know if she is a mathematician.

³⁵ Preliminary explorations seem to show that Catalan and Spanish lack a lexical form for our *even* (Eulàlia Bonet and Joan Mascaro, p.c.), highlighting even more the potential significance of lexical choice.

And as we saw with *wh*-questions (see fn. 11), Y/N-questions with our *even* contain an actual question, which can be, moreover, answered:

- (93) A: Let's get Joan to cook us something special.
 B: Is Joan even here?
 A: Why are you asking me this? Don't you know he is always here on Thursdays?
 A': Yes, I just saw him.

As in the *wh*-case, there is contextual entailment between the implicature of ignorance of the focused question and that of the QUD:

- (94) a. I don't know if it is warm-blooded. => b. I don't know if it is a mammal.³⁶

Finally, as with *wh*-questions, our *even* in Y/N-questions can appear on the VP or sentence-finally, but not on any other constituent:

- (95) A: Shall we get Joan to cook syrniki for us?
 B: Is Joan here even?
 B': Does Joan even know how to cook syrniki?
 B'': #Does Joan know how to cook even syrniki?³⁷

So we see that key characteristics of our *even* in *wh*-questions replicate in Y/N-questions. This gives certain promise that the analysis in (53), repeated as (96), extends to the Y/N-case.

- (96) $\llbracket \text{EVEN} \rrbracket^{w,g} = \lambda C_{\langle \langle \langle s, t \rangle, t \rangle, t \rangle}. \lambda q_{\langle \langle s, t \rangle, t \rangle}: \forall q' \in C [q' \neq q \rightarrow q <_w q']. q$
 where $q <_w q'$ if, given relevant facts in w , q is less likely than q' .

Consider (85), repeated as (97), again:

- (97) A: Shall we ask Joan to prepare something special for dinner?
 B: Is Joan even here?

Can we say that *even*'s focus is the question from the contextually restricted set of alternatives, C , that is least likely to be asked? Recall that we have identified C with the set of background questions. Given the current QUD, *Shall we ask Joan to prepare something special for dinner?*, the set of BQs will be something like the following:

- (98) a. Is Joan here?
 b. Can he cook?
 c. Is he willing to cook?
 d. Of the things he cooks, what do we like?
 d. Do we have the necessary ingredients?
 g. Are we going to have dinner at home?
 h. ...

³⁶ And this contextual inference, as with *wh*-questions (see fn. 29), can be diagnosed with the *let alone* test:

(i) A: is it a mammal, you think?
 B: I don't even know if it is warm-blooded, let alone if it is a mammal.
 (I don't know if it is warm-blooded and you are asking me if it is a mammal?)

³⁷ '#' here is used to indicate the absence of our *even*. The string is fine with focus on "syrniki".

This is parallel to the set of background questions we were dealing with in the Oleana example. In a similar way, in the *Joan* example the speaker asks *Is Joan here?*, (one of) the least likely questions from the set of BQs, thereby conveying, via the-asking-to-ignorance-link, that he is ignorant about the most basic thing relevant to the QUD.

We observed that in the *wh*-case, setting up a question that is not at the endpoint of the unlikelihood of ignorance scale results in awkwardness:

- (99) A: Let's meet at Oleana for dinner. Is that ok?
B: #What is the name of the chef even?

The same effect emerges in the Y/N case³⁸:

- (100) A: Shall we ask Joan to prepare something special for dinner?
B: Will he (#even) need a meet grinder (#even)? We don't have one.

We conclude, therefore, that there are good reasons to believe that the same semantics that we laid out for our *even* in *wh*-questions would work for Y/N questions as well. However, our *even* also shows a few peculiarities when it appears in Y/N-questions, which are discussed in the next section³⁹.

X. Discourse effects in Y/N-questions

We said earlier that there is a presupposition correction with our *even* in *wh*-questions. Specifically, B corrects A's presupposition that B had a certain background knowledge (the answerability presupposition). We would expect to be able to observe the same effect with our *even* in Y/N-questions. Here is (84) again:

- (101) A: Is this creature a mammal, you think?
B: Is it even warm-blooded?

B conveys that she does not have enough information to address A's question. This effect can be derived as with *wh*-questions. *Even* marks the question *Is it warm-blooded?* as the least likely one among contextual alternatives. (Indeed, part of the background list that A presumes that B has is that the creature is warm-blooded. If this assumption was not in place, the question of the creature being a mammal would not arise, since mammals are a proper subset of warm-blooded animals.) By her response, B signals that she does not know the answer to this basic item on the background list, hence is maximally uninformed with respect to the QUD and not in a position to answer it. This results in correcting A's presupposition that B has enough background information to answer the QUD⁴⁰. We conclude therefore that the same mechanism that generates the 'presupposition correction' contribution of our *even* in the *wh*-case is also at work in the Y/N-case.

³⁸ The response without *even* is fine, which shows that the infelicitousness is the effect of *even*, specifically, in our proposal, the result of *even* not focusing the appropriate question.

³⁹ So far we explored our *even* in *wh*-questions and Y/N-questions. Hopefully unsurprisingly, our *even* can also appear in alternative questions:

- (i) A: When my friend Tony visits next week, can you please take very good care of him? Can you take him where he wants to go and cook for him his favorite dishes?
B: Does he even prefer coffee or tea with his breakfast? (I know nothing about what he likes!)

Unfortunately, we do not have space to discuss alternative questions further here.

⁴⁰ We already saw that it is possible to answer the QUD in such cases but on grounds other than background knowledge (see (61)-(63) above). The same holds for Y/N questions:

However, there are also two apparent differences between our *even* in *wh*-questions and in Y/N-questions. The hope is that they will reduce to properties of *wh*-questions versus Y/N-questions.

The first difference may not be too difficult to diffuse. By assumption, our *even* in both *wh*- and Y/N-questions focuses the question that is the least likely question to be asked in the context, and this has the conversational impact that the speaker does not know *the most basic thing* about (an issue relating to) the QUD. This results in correcting the presupposition that the speaker can address the QUD.

In the case of our *even* in Y/N-questions there is a further conversational impact: an inference that the speaker does not know if *the most basic prerequisite* of the topic under discussion holds. Look at (84)(=101) again and remember that mammals are a proper subset of warm-blooded animals. In (84), B indicates that he does not know if the prerequisite for being a mammal holds. Unsurprisingly, the same intuition can be detected with the straight-out assertion of ignorance:

- (102) A: Is this creature a mammal, you think?
B: I don't even know if it's warm-blooded.

And the same "prerequisite effect" holds with (85) and (103). Joan would have to be here for him to be able to cook:

- (103) A: Shall we ask Joan to cook us something special?
B: Is Joan even here?

This "prerequisite effect" is a function of the fact that the focused question is a Y/N-question. We can set up a direct comparison with the *wh*-question under the very same QUD. It is only B's responses in (105) that have the prerequisite effect. The ones in (104) do not:

- (104) A: Shall we meet at Oleana for dinner?
B: Where is that even?
B': What do they even serve there?

- (105) A: Shall we meet at Oleana for dinner?
B: Is it even open at this time?
B': Can we even afford it?

We propose that the prerequisite effect derives from the fact that the answer to these questions should be *yes* for any other questions that rely on an affirmative answer to follow. For example:

- (106) [even C] [Q is it warm-blooded]_F

The answer *no* eliminates⁴¹ the whole set of subquestions of *Is it warm-blooded?*, including the QUD *Is this creature a mammal?* It is for this reason that this question has a "prerequisite" feel to it. This situation does not arise with *wh*-questions: There is no answer to the *wh*-question *Where is Oleana?* that eliminates the QUD *Shall we meet at Oleana for dinner?*

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- (ii) A: Shall we ask Joan to cook something for us?
B: Sure, *(but) is he even here?

⁴¹ Or, to use Rojas-Esponda's (2014) term, *resolves* them. To clarify a potential misunderstanding: When our *even* focuses a *wh*-question, as in (104), there may be an intuition of an "epistemic" prerequisite. I need to know where it is before I can tell you if I can go there. But this is not what we observe with the "basic prerequisite" in the Y/N case. There the effect of the focused question is that the world has to be a certain way (an affirmative answer to the focused question), for the issue/proposal in the QUD to be possible, as in (101), (103), (105).

Therefore, we believe that the prerequisite effect is fully derivable from the above analysis of our *even* supplemented with independently required assumptions about the role of Y/N-questions in organizing discourse structures (Roberts 2012, van Kuppenvelt 1991, 1996, Rojas Esponda 2014).

The second difference in the discourse effects between our *even* in *wh*-questions and Y/N-questions may be harder to account for. We said earlier (see fn. 12) that *wh*-questions with our *even* should not be seen as rhetorical or negative biased questions:

(107) Where is Oleana even? \neg -> Oleana is nowhere.

But in the Y/N-case an inference with negative bias is definitely possible:

(108) a. Is Joan even here? \rightarrow (Maybe) Joan is not here.
b. Is it even warm-blooded \rightarrow (Maybe) it is not warm-blooded.

As far as we know, the study of bias in questions with *even* has only been oriented towards the cases where the focus of *even* was a constituent of the question, as in (109), and not at cases where the focus of *even* is the entire question:

(109) Can Mary solve even [the easiest problem]_F?
 \rightarrow She cannot solve the easiest problem

Therefore, we would like to end this section by discussing a possible analysis to the negative bias in Y/N-questions (with or without our *even*), but also a shortcoming to this analysis.

It is possible to not know the location of a restaurant and not be in disagreement with a speaker who does. In fact, if you do not know the location of a restaurant, there is no space for such a disagreement. But things are different in the Y/N-case where there are only two possible answers: {p, \sim p}. In the case of (108a):{Joan is here; Joan is not here}. If there are only two cells, and I express that I question your choice of a particular one, it can only be because I consider the only other one a distinct possibility. Hence the inference of a negative bias. This issue does not arise with *wh*-questions.

Unfortunately, this may not be the complete solution. The above rationale assumes that the negative bias / disagreement with the speaker is the result of the fact that there is a two-cell (only) partition by the question {p, \sim p}. What would happen if we set up a context where a *wh*-question has only two possible answers? Then we would predict that the bias would re-appear, even if we did not see it in other *wh*-questions before. In principle, it may be possible to set up such an example.

Imagine the following context: the store across the street always carries vodka. Moreover, it carries only two types of vodka: horseradish vodka and honey vodka, though never on the same day. That is, on any one day it will have either horseradish vodka or honey vodka, but never both. We all know this. In addition, we all love horseradish vodka but despise honey vodka, and when we set out to buy vodka, we only and always buy the horseradish kind. We are considering having a party tonight.

(110) A: Shall we ask Masha to get some vodka?
B: Do they even have horseradish vodka today?
C: Which type of vodka do they even have today?

It seems to us that B's response can have an inference with a negative bias, namely that B believes that today is not a horseradish-vodka-day, but that C's response lacks such a bias.

However, C's question still only has a 2-cell partition: the store either sells horseradish vodka or honey vodka. Not both, not neither.

So given what we said earlier, we would expect a bias, but it does not appear that there is one⁴². What is the difference between a two-cell partition created by a Y/N question and a two-cell partition created by a *wh*-question? Somehow, with the Y/N question in (110B), we end up doubting the cell named by the sentence radical, *they have horseradish vodka today*. On the other hand, (110C) just asks the hearer to identify which cell we are in. It does not raise doubts about any one particular cell, possibly because it simply does not name⁴³ one. This may be a possible beginning for understanding the difference between (110B) and (110C), but obviously, more work needs to be done on the relationship between our *even* and biased questions.⁴⁴

XI. Embedded Questions

So far we have dealt with *even* focusing matrix questions. One obvious question that arises is whether we can detect the same phenomenon with embedded questions. At the outset we can see that our *even* cannot appear with every type of embedded question. Some question-embedding verbs block its use.

(111) #She knows where Tunica is spoken even.

(111) shows no sign of the epistemic inference associated with our *even*. However, there are some question-embedding expressions where our *even* does seem possible.

(112) a. She asked where Tunica is spoken even.
b. She asked where Tunica is even spoken.

(113) a. She wants to know where Tunica is spoken even.
b. She wants to know where Tunica is even spoken

Parallel examples can be found in other languages with our *even*. (114)-(115) exemplify the Russian counterparts of (111)-(112).

(114) *Volodja zna-l, gde voobšče ego drug.
V know-PST.M where VOOBŠČE his friend
'Volodja knew where his friend is even'.

⁴² If the reader disagrees with us and does feel a bias in (110C), even better. There is nothing to explain.

⁴³ Or highlight one (see Farkas and Roelofsen 2015 and references therein).

⁴⁴ Ashwini Deo (p.c.) suggested the following example as one more attempt to get a negative bias from our *even* in a *wh*-question:

(i) A: Bill wants to join a basketball team.
B: How tall is he even?

B's utterance can be seen as having a negative bias towards Bill not being tall enough for a basketball team. Note that (iB), as a *wh*-question, yields a multi-cell partition. However, all the (infinitely many) answers divide into two groups: those possible heights of Bill's that qualify him for the basketball team, and those that do not. So even though at a basic level, we have a multiple cell partition, at some other level we have a bifurcated partition. And possibly it is the latter that functions as the two-cell partition that brings about the negative bias. (Note as well that (iB) does not function as a Y/N question with the meaning 'Is he tall enough?': *yes* or *no* are not possible answers to this question.) If this is correct, more is to be said about how (i) is different from (110C). So unfortunately, the right answer to if and why (or why not) *wh*-questions can give rise to a negative bias, remains elusive.

- (115) Volodja sprosil, gde voobšče ego drug.
 V ask-PST.M where VOOBŠČE his friend
 ‘Volodja asked where his friend is even’.

Sentence (115) says that the question ‘Where is Volodja’s friend’ is the least likely to be asked with respect to Volodja’s (that is, the subject’s) ranking of background questions. Crucially, (115) has the ignorance inference characteristic of our *even*.

Given that our *even* can occur in embedded questions sometimes, the question is why not always. What is the difference between *ask*, *want to know* on the one hand and *know* on the other? At least two possibilities arise.

One possibility would go as follows: given that our *even* produces a compounded inference of ignorance, a question-embedding matrix verb should be compatible with ignorance. *Know* is not, hence (111) cannot contain our *even*. On the other hand, *ask* and *want to know* are fully compatible with ignorance, which, unsurprisingly, is subject-oriented.

The second way of ruling out our *even* under *know* while licensing it under *ask* and *want to know* presents itself if one were to accept the existence of speech act operators in the syntax whereby, matrix questions, and certain embedded questions, are formed by the QUEST operator. Manfred Krifka (p.c.) points out that if our *even* focused the entire question including the speech act operator, we would expect to only find it in embedded questions that contain a speech act operator. According to Krifka 2001, 2012, predicates like *ask* and *want to know* embed a question speech act operator whereas predicates like *know* only take ‘question roots’ as their complements. If Krifka were right, the unavailability of our *even* under *know* would follow. However, we need to figure out what the alternatives to speech act operators would look like (for example, whether alternatives would include different speech acts)⁴⁵.

How can we distinguish between the ignorance-compatibility-based account versus the speech act operator based account for the contrast in the pattern observed in (111)-(115)? One possibility is to find predicates that do not embed speech act operators, but are compatible with ignorance. One member of this class may be the predicate *don’t know*, which by Krifka’s tests behaves like *know* and does not embed a speech act operator, yet it is compatible with ignorance (in fact, it asserts it)⁴⁶. So can *don’t know* embed a question focused by our *even*? Examples like (116) suggest that it can, hence *don’t know* behaves like *ask*, not like *know*.

- (116) Volodja ne znal, gde voobšče ego drug.
 V NEG know-PST.M where VOOBŠČE his friend
 ‘Volodja did not know where his friend is even’.

⁴⁵ Sauerland (2009) decomposes the question speech act operator into two parts: an imperative part and a part relating to updating the Common Ground (CG). Sauerland and Yatsushiro (2014) argue that the particle *again* can scope in between these two parts, to produce the meaning of sentences like (i):

(i) What is your name again?

One could wonder whether, within a framework like Sauerland 2009 and Sauerland and Yatsushiro (2014), *even* would scope over both parts of the decomposed question operator or in between. We leave this for a different occasion, as well, as it is unclear to us what the alternatives of imperative part would be, nor the alternatives to CG.

⁴⁶ According to Krifka, only QUEST-embedding predicates permit the embedded question to be fronted:

(i) Who is the culprit, he wants to know.
 (ii) Who is the culprit, he asked.
 (iii) *Who is the culprit, he knows.
 (iv) *Who is the culprit, he doesn’t know.

It is actually surprising if *know* / *don’t know* and *want to know* differ with respect their ability to embed a speech act operator on syntactic grounds alone. After all, the syntactic locality between *know* and its complement is the same in all three cases. So possibly ignorance plays a role here as well.

If this is correct, ignorance suffices to permit our *even*, and a speech act operator is not necessary. However, before considering this conclusion settled, we would have to understand a lot more about speech act operators, and therefore, we leave this question for a different occasion.

Before concluding, we would like to discuss a remaining issue that can be integrated with the inner workings of our account⁴⁷. Consider the following few sample discourses:

- (117) Miranda does not know anything about Oleana and needed to ask the most basic things about the place. She asked even where it is.
- (118) Miranda is very curious about everything. I suggested we go to Oleana and she asked even what the shoe size of the chef is.
- (119) Miranda is very indiscreet and has no sense of privacy. She asked even how often Bill showers.

We see that when an embedded question is the focus of *even*, the associated scale can involve, at first blush, measurements along different dimensions. That is, the associate of *even* in (117) is at the endpoint of a scale of ignorance, in (118) of curiosity, in (119) of (im)politeness. In different terms, in (117) we see the question that is most likely to be known; in (118) the question that is least likely to be known; in (119), the question that is least likely to be asked while remaining within the bounds of politeness. (Of course, one could group (118) and (119) together as containing questions that are least likely to be asked on grounds other than the question being the most likely to be known.)

Such variability does not seem possible with our *even*:

- (120) I know nothing about the place. Where is it even?
- (121) I am very curious. #What is the chef’s shoe size even?
- (122) I am very curious. #How often do you shower even?

That is, a matrix question with our *even* can show extreme ignorance, but not extreme curiosity (which under circumstances can lead to impoliteness). This is unexpected under our account, as all that is required for us is that *even* focus a question. If *even* focusing an embedded question in (117)-(119) can access these different scales, why should *even* focusing a matrix question not be able to do this?

But the plot thickens: in the languages with different forms for *even* that we have explored in Section VIII, the lexical item chosen for *even* in (117)-(119) is not the lexical item for our *even* (e.g. Russian *voobščē*, as in (116)). And neither is it the lexical item for ML *even* (e.g. Russian *xotja by*). It is, in fact, the lexical item for garden variety LL *even* (e.g. Russian *daže*). Crucially, *daže* in (123) allows for the same range of readings as *even* does in (117)-(119), including the extreme curiosity scenario.

- (123) Volodja (daže) sprosi-l (daže), gde eto.
V DAŽE ask-PST.M DAŽE where this
‘Volodja even asked where it is’

Unlike *even* in (117)-(119) and *daže* in (123), our *even/ voobščē* is only compatible with the extreme ignorance scenario in (117):

⁴⁷ We are grateful to a reviewer for pointing us in this direction.

- (124) Volodja sprosil, gde eto voobščē.
 V ask-PST.M where this VOOBŠČE
 ‘Volodja asked where it is even’,⁴⁸

In other words, in English the situation is obscured by the fact that there is only one *even*. In English it looks like *even* sometimes has access to an ignorance based scale (our *even*) and sometimes to a curiosity based scale. What we see when we look at different languages is that the choice of lexical item correlates with the choice of dimension of measurement for the scale. It is the *voobščē*-scale that singularly correlates with the scale of ignorance that is at the base of our *even*. Unfortunately, since the mechanism of the lexical choice is obscure to us at the moment, we are unable to address related questions as well and have to leave it for future research.

XII. Conclusions

In this paper we discussed a phenomenon that appears when *even* occurs in questions. We attempted to reduce the properties of these instances of *even* to the more known unlikelihood *even*, but with its focus being the entire question. This reduction was built on a number of similarities, including the fact that they both operate on an unlikelihood (or equivalent) scale. In the case of our *even*, the elements of the scale are a set of questions containing the focused question and background questions relevant to the QUD. The ordering is the (un)likelihood of the question being asked.

The implicature of extreme ignorance appears because the least likely question to be asked corresponds, via the Asking-to- Ignorance link, to the question whose answer one would be most likely to know. Not knowing the answer to the question whose answer is the most likely to be known amounts, by the working of the scale, to not knowing the answer to other questions, resulting in the “extreme ignorance” effect.

Other effects of our *even* in questions include the correction of the speaker’s presupposition(s). The speaker, when raising the QUD, assumes that we are in a position of addressing it. Uttering our *even* question, we implicate that we are ignorant about the most basic thing, and thereby correct the presupposition the speaker made about our knowledge.

We also saw that our *even* in Y/N-questions shows both similarities and differences with our *even* in *wh*-questions. The differences were argued to reduce to independent properties of Y/N-question and *wh*-questions, which are carried over when they are the focus of *even*.

Finally, leaving English behind, we saw that in different languages, the choice of lexical item matters for our *even* to appear. The questions relating to the matter of lexical choice include whether the item that has the effects of our *even* is an NPI or not, and if it is, why it should be; what exactly happens in languages when the lexical item translates as “at all” in other environments; what sort of scales (ignorance versus curiosity, for example) accompany each lexical choice. However, we did not explore the specifics underlying the choices of lexical item in any depth. We trust that future research will clarify these and other remaining questions.

Though the choice of the term “our *even*” is based on emotional reasons, we recognize that it is unclear how others would be able to refer to these uses of *even* without running into difficulties with respect to the choice of the indexical. For this reason, and given our analysis, we suggest the term

⁴⁸ It should be pointed out that Greek does not allow *kan*, the counterpart of *voobščē* in most of our *even* environments, to occur in sentences like (125). *Akoma ke*, the counterpart of garden variety *even* is to be used instead. Hopefully, future research will determine what the difference between Greek in Russian is due to.

‘QF *even*’ for “Question Focusing *even*’. Our hope and aim was to show that there is good reason to believe that QF *even* can be reduced to garden variety *even*, and that any special properties that can be observed are due to the combination of properties of garden variety *even* with properties of questions. This hope is reflected in the term ‘QF *even*’.

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