

# Our *even*

## I. A quick general background on *even*

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. The contribution of *even* consists of two presuppositions:

- (2) The unlikelihood 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

Even though the exact nature of the unlikelihood presupposition has been debated (for example see Kay 1990 for the alternative notion of noteworthiness), its existence has not been disputed. We will assume for now then that *even* comes with something like an unlikelihood scale and that its focus (*Lev* in (1a)) is the endpoint of the scale. (However, alternative views of the nature of the scale should be compatible with what we say below as well.)

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 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.

## **II. A quick general background on *even* in questions.**

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. 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-*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, different forms appear in ML and in LL environments. 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.

The examples in (5) and (6) are lexically chosen to bring out either the LL or the ML reading, due to the presence of “hardest” and “easiest”. However, a sentence like (7) is ambiguous:

(7) Does Bill even like Mary?

On the LL reading, Mary is hard to like and Bill comes out as the universal liker. On the ML reading, Mary is easy to like and Bill comes out as the universal hater.

For the Movement camp, in the ML reading *even* has moved to a position higher than in the LL reading. Since this movement is optional, (7) is ambiguous. For the NPI camp, the ML reading contains NPI *even*, which is a different lexical item from LL *even*. Since (7) is a question, both NPI and non-NPI *even* are licensed, and so the sentence is ambiguous.

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.

### III. Enter our *even*

Consider the following discourse:

- (8) A: Let’s meet at Oleana’s<sup>1</sup> for dinner. Is that OK?  
B: Where is that even?

B’s utterance conveys that he knows nothing about Oleana’s. Not even where it is.

We will refer to *even* in (8B) as ‘our *even*’ 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 Discussion<sup>2</sup> (Roberts 2012, van Kuppevelt 1995a,b 1996, Buering 2003). We will call this inference “inference of extreme ignorance”.

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<sup>1</sup> Oleana’s is a restaurant in Cambridge, Massachusetts.

<sup>2</sup> The QUD does not have to be a question strictly speaking. It can be a topic.

Our *even* cannot appear in declarative sentences. (9) lacks the inference of extreme ignorance:

(9) Lev has (even) read Anna Karenina (even).

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

(10) 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 unlikelyhood *even*. We will start with Wh-questions.

#### **IV. Wh-questions plus our *even***

Our *even* can be VP-adjoined or sentence-final<sup>3</sup>:

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<sup>3</sup> Throughout this paper, we remain agnostic as to what the attachment site of the sentence-final *even* is.

- (11) A: Shall we go to Oleana's for dinner?  
B: a. What do they even serve there?  
b. What do they serve there even?

- (12) 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:

- (13) #Where is even Oleana's?  
(14) 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) again, where the focus of *even* is *Lev*. Consider a model where there are four children: Lev, Olivia, Lena and Miranda.

(15) Even [Lev]<sub>F</sub> came to the party

The associate of *even* is replaced by other elements in the domain, thereby generating a number of propositions.

- (16) a. Olivia came to the party  
b. Lena came to the party  
c. Miranda came to the party  
d. Lev came to the party (a trivial alternative to itself)

According to the unlikelihood presupposition the propositions (16a-c) are more likely than the proposition with the associate of *even*, namely (16d).

Now let us look at an example where *even* has sentential focus (as opposed to NP-focus, as in (1)). Consider the following monologue:

- (17) 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]<sub>F</sub>



The example is hopefully set up in such a way that it is clear that the alternatives to (17d) are (17b,c)<sup>4</sup>. In other words, when the focus of *even* is sentential, the alternatives can, as expected, have no material in common with the sentence containing it.<sup>5</sup>

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?<sup>6</sup> Sentential focus in a question should in principle permit two scopal possibilities at LF :

- (18) a.     *even* [Q+where is that]  
      b.     [Q+where *even* is that]

There are a few reasons to prefer (18a) over (18b).

The meaning of (18b) would roughly be (19):

- (19) What is the location x such that Oleana's is at x is the most unlikely proposition.

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<sup>4</sup> (17d) is provided as an example of sentential focus in Karttunen and Karttunen 1977, though given there without context.

<sup>5</sup> In the words of Kay (1990), in examples like (17d), the scope and focus of *even* are *co-terminus*.

<sup>6</sup> We will assume that the interrogative operator (Q) and the *wh*-word are in the same position in the sense that they cannot be scopally split apart .

It does not seem that such a meaning is detectable<sup>7</sup>. But most relevant for our purposes, this is distinctly not the meaning of our *even*.

On the other hand, (18a) seems to capture the intuition that the entire question is in focus, as we will see. Moreover, *even* has no problem scoping over certain sentential operators. The meaning of (19a) is as in (19b):

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

So in principle it could be scoping over and focusing the Q-operator as well. But there is also a potential problem for the claim that our *even* has sentential focus. Fortunately, it will only be an apparent problem.

When *even* focuses an embedded sentence, it cannot appear inside it:

- (21). He told us many things about himself...  
a. He even said [that he showers twice a day]<sub>F</sub>

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<sup>7</sup> 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).

- b. He said even [that he showers twice a day]<sub>F</sub>
- c. #He said that [he even showers twice a day]<sub>F</sub>

The string in (21c) is grammatical, of course, but it is not good in context. That is, it is good only with focus within the embedded clause, like (21), for example:

(22) He said that he even [showers]<sub>F</sub> twice a day

The same holds for *even* focusing embedded questions. It cannot appear inside its focus, as can be seen in (23c).

- (23) He asked many things...
- a. He even asked [who we vote for]<sub>F</sub>
  - b. He asked even [who we vote for]<sub>F</sub>
  - c. #He asked [who we even vote for]<sub>F</sub>

But this raises an obvious question: if sentential focus *even* cannot appear inside its focus, then how can we claim that our *even* has sentential focus but still appears inside its focus in the overt string? That is, how can we claim that the LF of (24) is (25)?

(24) Where is that even spoken?

(25) LF: even [where is that spoken]<sub>F</sub>

To obtain the LF in (25), would one not have expected the string in (26), instead of that in (24)?

(26) \*Even<sub>F</sub> where is that spoken?

However, (26) is ungrammatical! We do not know why (26) 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:

Table 1

	[matrix sentence] <sub>F</sub>	[embedded sentence] <sub>F</sub>
<i>even</i> can appear inside its focus	+	-

Table 1 captures the following facts: When *even* focuses an embedded declarative, *even* appears outside, not inside its focus:

- (27) a. He said even [that he showers twice a day]<sub>F</sub>  
 d. #He said that [he even showers twice a day]<sub>F</sub>

When *even* focuses a matrix declarative, *even* cannot appear in a sentence-initial position, but it can appear inside its focus<sup>8</sup>:

- (28) a. #Even [Harvard held a pep rally last night]<sub>F</sub>  
b. (=16d) [Harvard even held a pep rally last night]<sub>F</sub>

Similarly, when *even* focuses an **embedded** question, it appears outside, not inside its focus:

- (29) b. He asked even [who we vote for]<sub>F</sub>  
c. #He asked [who we even vote for]<sub>F</sub>

When *even* focuses a **matrix** question, it cannot appear in a sentence-initial position, but it can appear inside its focus:

- (30) a. (=25) \*Even [where is it spoken]<sub>F</sub>?  
b. [where is it even spoken]<sub>F</sub>?

We do not know what the pattern in Table 1 is due to. But what is relevant for us at this point is that this larger pattern does not raise an obstacle to considering the LF representation of (28) to be that of (29):

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<sup>8</sup> It can also appear in sentence-final position, as we saw (Kay 1990, Wagner 2014)

(31) [where is it even spoken]<sub>F</sub>?

(32) LF: even [Q+where is it spoken]

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; 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 (33) with that in (34):

(33) A: Let's meet at Oleana's for dinner. Is that ok?

B: Where is that even?

B': What do they even serve there?

(34) A: Let's meet at Oleana's for dinner. Is that ok?

B: #What is the name of the chef even?<sup>9</sup>

This contrast raises the suspicion that the scale is one of unlikelihood of ignorance. In (33), the speaker conveys that even the most unlikely thing for her to be ignorant about with

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<sup>9</sup> The chef of Oleana's is Ana Sortun.

respect to Oleana's, 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, (34) is odd and its oddness is due to the focus of *even* not being the least likely thing one can be ignorant about<sup>10</sup>. In other words, (34) violates the requirement of *even* to pick out the endpoint of an unlikelihood scale. That is, its oddness is like that of (35) when Max is an avid reader:

(35) Even Max read the book.

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

(36) A: Shall we go to Oleana's?

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*. But a question arises at this point: if the conversational impact of our *even* is that the

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<sup>10</sup> Though, possibly a discussion among food critics could go this way.

speaker is ignorant about the most basic things pertaining to Oleana's, does it still contain a question? That is, (8B/36B) *looks like* a question, but is it interpreted as such?

Certainly, it can be answered:

(37) A: Let's meet at Oleana's for dinner.

B: Where is that even?

A: It's on Hampshire street.

But the fact that it can be answered does not suffice to consider (37B) an honest-to-goodness-question, because if all (37B) conveyed was that B does not know where Oleana's is, it could still trigger an answer from a cooperative interlocutor, just as a straight-out assertion of ignorance would:

(38) A: Let's meet at Oleana's for dinner?

B: I don't know where it is.

A: It's on Hampshire street.

However, (8B) seems to indeed be understood as a question, as can be shown by the possibility of A's following up as below <sup>11</sup>:

(39) A: Let's meet at Oleana's for dinner.

B: Where is that even?

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<sup>11</sup> Many thanks to Kai von Fintel for this test.



A: 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:

(40) A: Let's meet at Oleana's for dinner.

B: I haven't heard of that place.

A: #Why are you asking that? Don't you trust me to take you somewhere nice?

To summarize, what we have seen is that our *even* focuses an entire *actual* 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. But before we close this section, a quick aside.

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. (Often this answer is of opposite polarity of the question.) For example, (41), from Han 2002, is meant to convey the inference in (42):

(41) What has John ever done for Sam?

(42) John has done nothing for Sam

Could it be that questions with our *even* are rhetorical questions of this kind? While we will return to this issue later in the paper, for now the answer seems to be that they are not.

First of all, 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 Question Under Discussion. This ignorance is incompatible with the speaker knowing the (positive or negative) answer to the rhetorical question.

## V. Ignorance

When a speaker utters a question like (43a), it is possible to draw the inference in (43b):

- (43) 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 (43a).

We define ignorance as follows:

- (44) An individual *i* is ignorant of a question *q* iff *i* does not know what the answer to *q* is.

The intuition that we have been following so far is that our *even* appears to come with a scale of unlikelihood of ignorance. Given (44) this would mean that the questions are ordered by the likelihood of the speaker knowing the answer to them.

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

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

- (45) 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?  
etc.

The questions are (partially) ordered by likelihood of their answer being known. We are less likely to be ignorant about (a) than about (b), (b) than (c), etc.

Therefore, the focused question is the endpoint of the scale on which background questions like those in (45) are arranged. This fact provides an understanding of how the inference of extreme ignorance comes about.

By the workings of the scale, the speaker, by indicating that s/he is ignorant of the question that one is least likely to be ignorant about, conveys thereby that s/he is ignorant of the questions that she is more likely to be ignorant about.

So what we have so far is captured in (46-51):

(46) Utterance:

Where is that even?

(47) LF Representation:

even [Q+where is that]

(48) Presupposition:

'Where is that?' is the question one is least likely to be ignorant about

(49) Conversational Implicature:

I don't know [where it is]

(50) Compounded inference:

I do not know the answer to the question I am the least likely to be ignorant about

(51) Implicature of **extreme** ignorance:

I do not know the answer to any other questions about Oleana's

## VI. Interim stock-taking and another view of ordering

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 item.
- The ordering of elements of the scale is naturally described in terms of likelihood
- 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 working hypothesis to be able to continue to stand.

So far we have the following two tenets:

(52) **Garden variety *even*** picks out the proposition that is least likely to be true of a list of propositions.

(53) **Our *even*** picks out the question that we are the least likely to be ignorant about.

The distance between (52) and (53) is significant. We will attempt to change (53) to make the difference smaller. Specifically, instead of (53) we will suggest (54):

(54) 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.

In other words, 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.

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*:

(55) In uttering "even  $\varphi$ " a speaker conveys that among all the contextually restricted focus alternatives of  $\varphi$ ,  $\varphi$  is the *least likely to be sincerely utterable*.

When applied to declaratives and questions, this gives us (56a, b):

(56) 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.

So from now on, we will assume that our *even* picks out the question that is least likely to be asked (in context) and not the question whose answer one is least likely to be ignorant about.

However, the ordering of ‘least likely to be ignorant about’, which was the first intuitive way of capturing the meaning of our *even* is not lost. Only, now it becomes derivative. 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”)<sup>12</sup>. The more likely it is the answer to a question is known, the less likely it is that the question will be asked.

Here is a summary of the derivation of the implicatures from the various ingredients:

- 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.
- 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.

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<sup>12</sup> If Roelofsen’s suggestion is right, ‘sincere utterability’ would also capture the “asking-to-ignorance-link”.

So instead of (46)-(51), we have (57)-(63). The differences lie in (48) vs (59) and what results from that, as well as the presence of (61).

(57) Utterance:

Where is that even?

(58) LF Representation:

even [Q+where is that]

(59) Presupposition:

'Where is that?' is the question that is least likely to be asked

(60) Conversational Implicature:

I don't know [where it is]

(61) Asking-to-Ignorance link:

The likelihood of asking a particular question is reversely proportional to the likelihood of knowing the answer to this question.

(62) Compounded inference

I do not know the answer to the question whose answer is the most likely to be known

(63) Implicature of **extreme** ignorance:



I do not know the answer to any other questions about Oleana's

Therefore, by changing the ordering to 'likelihood of being asked' we do not have to give up the intuition that there is an ordering of ignorance.

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 (64). We will make the argument based on the speakers who accept it. We do not know why there should be variation on this point.

Imagine a classroom that has had as its focus of study for the last month the country of Bolivia. Students studied its history, geography, its 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:

(64) 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 about:

(65) #Bobby! Where is Bolivia's 4<sup>th</sup> largest city even?

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 (8B), repeated below, the ignorance would be the speaker's and in (64) the hearer's (namely, Bobby's).

(66) A: Let's meet at Oleana's for dinner.

B: Where is that even?

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.

The strongest argument in favor of having the ordering being one of being asked is the improbability of our *even* directly 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*. 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. That is, (67) is felicitous if Q1 is the least likely question to be asked.

(67) even Q1

For now, one could frame this in terms of the performative hypothesis of Karttunen (1977), in which every matrix question is preceded by a covert “I ask” prefix, (68a), or in terms of *even* scoping over a speech act operator (cf. Krifka 2001, 2012), (68b):

- (68) a. I even ask [where is that]<sub>F</sub>.  
b. even [QUEST [where is that]]<sub>F</sub>

Obviously, (68b) raises questions about *even* focusing embedded questions, a topic to which we will return.

To summarize this section, then, from now on, we will be assuming that our *even* focuses the question that is least likely to be asked and 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 type-theoretical 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.

## VII. Some technicalities

Now we have everything we need to formulate the semantics of our *even* in the way where it maximally resembles garden variety *even*. *Even* is a function of type  $\langle\langle\langle\langle s,t \rangle, t \rangle, t \rangle, \langle\langle s,t \rangle, t \rangle, \langle\langle s,t \rangle, t \rangle \rangle\rangle$ . 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.

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

Take for example, a question with our *even* as in (70) (basically (12)):

- (70) Where is Tunica even spoken?

Its LF is as in (71):

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

(71) is only defined if *Where is Tunica spoken?* is contextually the least likely question (to be asked). When defined, the LF represents that very question.

$C$ , 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).

- (72)  $C \subseteq \llbracket \text{where is Tunica spoken?} \rrbracket^f$

The focus value,  $\llbracket \text{where is Tunica spoken?} \rrbracket^f$ , 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 (70) is shown in (73)-(80).

(73) TP denotation<sup>13</sup>

$$\llbracket \llbracket_{\text{TP}} \text{Tunica is spoken } t_1 \rrbracket \rrbracket^{w,g} = \lambda e. \text{Tunica is spoken in } e \text{ in } w \wedge e \text{ is at } (g(1)) \text{ in } w$$

(74) Existential closure

$$\llbracket \llbracket_{\text{TP}} \exists_e \llbracket \text{Tunica is spoken } t_1 \rrbracket \rrbracket \rrbracket^{w,g} = 1 \text{ iff there is an } e \text{ such that Tunica is spoken in } e \text{ in } w \wedge e \text{ is at } (g(1)) \text{ in } w$$

(75) The ?-morpheme

$$\llbracket ? \rrbracket = \lambda p. \{p\}$$

(76) Proto-question formation

$$\llbracket \llbracket ? \llbracket \exists_e \llbracket \text{Tunica is spoken } t_1 \rrbracket \rrbracket \rrbracket \rrbracket = \{\text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } (g(1))\}$$

(77)  $\lambda$ -abstraction

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<sup>13</sup> For simplicity we ignore issues surrounding habituality and genericity. We are also abstracting away from tense.

$\llbracket 1 ? [ \exists e [ \text{Tunica is spoken } t_1 ] ] \rrbracket^{w,g} =$

$\lambda x. \{ \text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } x \}$

(78) Semantics of *where*

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

(79) Semantics of the question

$\llbracket \text{where } 1 ? [ \exists e [ \text{Tunica is spoken } t_1 ] ] \rrbracket =$

$\lambda Q. \{ p: \exists x [ \text{location } (x) \wedge p \in Q(x) ] \} (\lambda x. \{ \text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } x \}) =$

$\{ p: \exists x [ \text{location } (x) \wedge p = \text{that there is an } e \text{ such that Tunica is spoken in } e \wedge e \text{ is at } x \}$

(80)  $\llbracket [ [ \text{even } C ] [ \text{where } [ 1 ? [ \exists e [ \text{Tunica is spoken } t_1 ] ] ] ] ] \rrbracket^{w,g}$  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:

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

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.

Before closing this section, we would like to extend further the commonalities by pointing to 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, but without choosing between the different views.

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) felicitously, should Lev be THE least likely person to go to a party or just less likely than most?

(81) Even Lev came to the party

The same question can be asked for (8B):

(82) 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* (8B)/(82), as for garden variety *even* in (1)/(81).

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:

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

After (83a), one would expect (83b) to be redundant, but it isn't<sup>14</sup>. How could this be? One might say that (83b) does not feel redundant because somehow the common ground has not yet been updated with (83a) when (83b) is uttered. Or, the common ground has been updated but (83b) provides a widening of the domain on which *everybody* operates<sup>15</sup>. Whatever the reason, we see the same effect with our *even*:

(84) a. I know nothing about Oleana's. b. Where is it even?

After (84a), the implicature of ignorance in (77b) would be entailed, yet it does not feel redundant. Again we can talk about suspension of update of the common ground or domain widening. And the same holds, of course, with the straight-out assertion of ignorance with *even*:

(85) a. I know nothing about Oleana's. b. I don't even know where it is.

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<sup>14</sup> In fact, the presence of *even* in (83b) seems to be required.

<sup>15</sup> Andersson (2006) argues, specifically, that *uberhaupt*, 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 (83).



In short, our *even* has many similarities with garden variety *even*, including some open questions.<sup>16</sup> We conclude then that there is nothing odd about our *even*. It is nothing other than garden variety *even* which focuses an entire question.

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<sup>16</sup> Imagine the following discourse:

- (i) #I know almost everything about Oleana's but/and where is it even?
- (ii) #I know almost everything about Oleana's but/and I don't even know where it is.

The sentences sound definitely odd but what do they violate? Imagine that I indeed know many things about Oleana's but there are three facts that I do not know. Of these, the least likely item to be ignorant about is its location. So it is indeed quite surprising that I do not know where Oleana's is, especially given that I know many things about. So the presupposition of 'least likely question to be asked' (or be ignorant about) is satisfied. Moreover, if one is concerned about a separate additive presupposition, this too is satisfied, given that there are two other things that I do not know. So everything we have talked about seems to be in place, yet the sentences are infelicitous. Is this not a problem for our theory?

The answer to this is 'yes and no'. Yes, because indeed the facts are not predicted by anything we have said so far. No, because it is a problem for garden-variety *even* also. We can duplicate the situation exactly: Imagine that out of a 50 invitees, only 3 came to the party. Of those 3 (or if you want, even of all 50) Max is the least likely to go the party, yet he did. Even so, (iii) is infelicitous:

---

(iii) #Almost nobody came to the party but/and even Max came

The unlikelihood presupposition is satisfied, as is the additive presupposition. Yet, the sentence does not work.

Our current intuition is that the status of (iii) (and *ceteris paribus* of (i)-(ii)) reveals that there is a requirement on sentences with *even* for a domain extension that is (unexpectedly, given the unlikelihood presupposition) large in context. When the main assertion of the first part of (iii) asserts that the size of the group of attendees is very small, *even* cannot achieve a domain extension. Yet, the requirement for it to do so is such that it cannot be canceled (so it is *not* a conversational implicature).

Perhaps the requirement for a (surprising) extension of the domain is, in fact, the essence of the unlikelihood presupposition of *even* and the requirement that the assertion be the least likely proposition is but a side-effect of the actual unlikelihood presupposition. After all, it is the truth of the least likely proposition that normally yields the domain extension.

We are at present not in a position to defend this intuition but we would like to point out that the issue of (i)-(ii) is duplicated in (iii), and therefore is not a problem of our analysis of our *even* per se.

Before closing this footnote, we would like to note that a sentence like (iii) is salvageable, provided one readjusts the domain explicitly so *even* can achieve the desired extension:

(iv) Almost nobody came to the party. But the few people who did come were all high flyers. In fact, even Obama came.

## VIII. Interactions with discourse

In this section we will examine two further 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.

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

(86) A: Shall we go to Oleana's?

B: Where is that even?

We have already seen how speaker B conveys that s/he knows nothing about Oleana's. 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. That is, "I don't know where Oleana's is" can end up contextually entailing "therefore, I do not know if I want to go there"

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

(87) A: Shall we go to Oleana's?

B: I don't know [where that is], let alone [if I want to go there]<sup>17</sup>.

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<sup>17</sup> Predictably, the reverse ordering is bad:

Here we need to make a small interlude a propos of (87), 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 (76) 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. End of interlude.

We saw above that B's response can be interpreted as an inability to answer the QUD. However, this is only a conversational implicature. It is possible to answer the QUD and still follow up with our *even*:

(88) A: Do you want to go to Oleana's?

B: Sure. We can go wherever you want. But I know nothing about this place. Where is it even?

In (88), 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.

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(i) A: Shall we go to Oleana's?

B: #I don't know if I want to go there, let alone where that is.

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

(89) A: Do you want to go to Oleana's?

B: Sure. #Where is that even?

However, a "but" suffices:

(90) A: Do you want to go to Oleana's?

B: Sure. But where is that even?

The second discourse effect that we would like to address in this section is that our *even* in questions can sound inappropriate in context. Compare Bobby's response in (91) with that in (92):

(91) a. Teacher: Bobby, do you know how to use a triangulator?

b. Bobby: No. What is that?

(92) a. Teacher: Bobby, do you know how to use a triangulator?

b. Bobby: #No. What is that even?

(92b) 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 correction<sup>18</sup>.

There are felicity conditions on asking a question. These include the presupposition that the hearer should be able to answer the question. That is, with the exception of conjectural questions (see e.g. Littell, Matthewson and Peterson 2010), (93) holds:

(93) When the speaker S asks Q of hearer H, S presupposes that H is in a position to answer Q

(93) captures the fact that ones does not ask one's 13-year old daughter what the correct analysis of ACD is<sup>19</sup>.

"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

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<sup>18</sup> This effect seems to be largely inescapable. Certainly in (92b) it is not cancellable. We do not know why this might be.

<sup>19</sup> 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?

(8A)/(94) of B, A presupposes that B has the relevant background information that he will draw on to answer the QUD:

(94) A: Do you want to meet at Oleana's for dinner?

We already described this as the Background List:

- (95) a. Oleana's 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  
etc.

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:

(96) A: Let's meet at Oleana's.

B: Why do you think that I know where that is?

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

(97) A: Let's meet at Oleana's.

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's to answer the QUD. B asks a question that is least likely to be asked. This implicates that B does not have minimal relevant information, which signals 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.

We can similarly explain the contrast between (98) and (99), where # is used for social inappropriateness:

(98) General: Soldier! Put the ammunition behind the shed.

Soldier: Sir! Where is the shed, sir?

(I do not know where the shed is, sir!)

(99) General: Soldier! Put the ammunition behind the shed.

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 (92) and (99) 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 ways:

(100) 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 (100B), 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 question assertions. This is shown in (100)-(101), though we need to borrow examples from our *even* in Yes/No questions, to which we will get in a later section:

(101) A: This animal is a mammal

B: Are you sure it's a mammal?

B': #Is it even a mammal?

(102) A: Joan is here.

B: Is he really here?

B':# Is he even here?

## IX. Our *even* and the additive presupposition.

We saw at the beginning of the paper that garden variety *even* has an additive presupposition. From (1) there is an inference that other people besides Lev 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.

We would like to not take sides in the present paper on the issue of an independent additive presupposition but of course, the question arises whether we can detect its presence with our *even*. So we will cover our bases and give two different responses, one for each of the two possible answers to the question of an independent additive presupposition.

Let's look at our original discourse again:

(103) A: Let's go to Oleana's 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 (more likely) alternatives are other background questions:

(104) a. What is it?

b. Where is it?

c. What do they serve?

d. Is it expensive?

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?

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 there is no additive presupposition because none of the other background questions have been asked (remember that the QUD is not a background question). If this is the correct conclusion, then we can 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 focus. While Wagner argues this on the basis of declaratives, it should be extendable to *even* having sentential focus over a question, as is the case with our *even*.

If, on the other hand, it turns out that there is an additive presupposition after all and thereby we would be forced to find it with our *even* as well, we could argue as follows. Certainly the additive presupposition is not satisfied by other background questions having been asked. But does this mean that the 'no additive presupposition' side wins? One possible comeback might be the following: the additive presupposition is satisfied by the background questions being alluded to. And it is definitely the case that such exist, as they provide the background on which the QUD is expected to be answerable. However, this path faces some difficulties. Since we want to leave open the possibility for a unification between our *even* in questions and *even* focusing entire propositions, 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. In short, the question of the additive presupposition for our *even* should either be left open at this point, or, we would have to decide that the no additive-presupposition for sentential focus *even* is correct, as in Wagner 2014.

## X. 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 Greek, garden variety *even* is “*akoma ke*”<sup>20</sup>, but our *even* is “*kan*”:

(105) **Akoma ke/\* kan** o Lev irthe sto parti  
AKOMA KE/\* KAN the Lev came to.the party  
'Even Lev came to the party'

(106) Pu ine **kan/\*akoma ke** afto?  
where is KAN/\*AKOMA KE this  
'Where is that even?'

In Russian, garden variety *even* is *daže* but our *even* is *voobšče*:

(107) **Daže / \*voobšče** Džon prišel na večerinku  
DAZE / \*VOOBŠHCHE John came to party  
'Even John came to the party'

(108) Eto voobšče / \*daže gde?

<sup>20</sup> See Giannakidou (2007) for a broad discussion of several *evens* in Greek.

this VOOBSCHE/ \*DAZE where

'Where is that even?'

And we see the same picture in German:

(109) Sogar/\*überhaupt Hans kam zu der Fete  
SOGAR/\*UBERHAUPT Hans came to the party  
'Even Hans came to the party'

(110) Wo ist das überhaupt<sup>21</sup>/\*sogar?

---

<sup>21</sup> 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 Y/N questions are permitted. If our *even* marks ascending moves, and if ascending moves, when construed as questions, must be Y/N 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 finding a way to incorporate our *even* in *wh*-questions into the view advanced by Rojas-Esponda may face difficulties.

For example in (8), it is not obvious what the superquestion is which B's utterance comes to doubt or resolve:

where is that UBERHAUPT/\*SOGAR

'Where is that even?'

What is the significance of the fact that our *even* is a different form from garden variety *even* in some languages? In section II, 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.

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(8) A. Shall we meet at Oleana's 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 Y/N questions extends straightforwardly to alternative questions, where our *even* can also appear, as we will see.

Finally, without further elaboration, it is not immediately obvious if the analysis of *überhaupt* in Y/N questions extends straightforwardly to alternative questions.

It would be natural to wonder whether the question of a separate form for our *even* should be connected to this debate. The answer to this question is actually unclear. It so happens that the forms our *even* take in the three languages, do indeed require negation in declarative sentences:

(111) o      Lev    dhen   milise **kan/\*akoma ke**    me    tin    Miranda  
          the    Lev    not    talked KAN/\*AKOMA KE    with   the    Miranda  
          ‘Lev did not talk with Miranda’

(112) Lev    voobshche    ne    chital “Devida    Kopperfil’da”  
          L.    VOOBSHCHE    NEG    read    D.            C.  
          ‘Lev did not read “David Copperfield” at all’

(113) Ich    habe    es    überhaupt    \*(nicht)    gesehen  
          I      have    it      UBERHAUPT    \*(not)      seen  
          ‘I have not seen it at all’

So the Movement camp can indeed 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:

(114) 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 (115a) (115b), where *even* is in the scope of negation<sup>22</sup>:

- (115) 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 “voobshche”:

(116) Russian

Maša	mož-et	reši-t'	xotja	by /	*voobšče /	??daže	prost-ejš-uju
M.	can-PRS.3SG	solve-INF	XOTJA	BY	VOOBŠČE	DAŽE	simple-SUP-ACC

zadač-u?  
 math.problem-ACC  
 'Can Mary solve even the easiest math problem?'

---

<sup>22</sup> However, if von Stechow (1997) is right that NPI-licensing ignores non-truth conditional components of meaning, a conversational implicature cannot license NPIs.



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 (117), Mary can be the least likely or the most likely person to like.

(117) Does Bill even like Mary?

In the case of our *even*, there is no ambiguity. Therefore, we are not dealing with ML *even*<sup>23</sup>.

Even so, the question of the choice of the lexical item for languages like German, Greek and Russian exists. 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 *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 now.

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<sup>23</sup> 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 (116). However, in the case of our *even*, there is no issue of lexical choice pragmatically excluding one reading.

## XI. Our *even* in Yes/No Questions

In this section, we explore the appearance and properties of our *even* in Yes/No questions.

Consider (118)-(120):

(118) A: Is this creature a mammal, you think?

B: Is it even warm-blooded?

(119) A: Let's get Joan to prepare something special for dinner.

B: Is Joan even here?

(120) A: Did Olivia get the Fields Medal?

B: Is Olivia even a mathematician?

B's responses in (118)-(120) 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:

(121) Ine **kan** edho o Yanis Greek

is KAN here the Yanis?

'Is Joan even here?'

(122) Vanja **voobšče** zdes'? Russian

V. VOOBŠČE here?

'Is Vanja even here?'

(123) 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 :

(124) A: Is this creature a mammal, you think?

B: Is it even warm-blooded?

B'. I don't even know if it is warm-blooded.

(125) A: Let's get Joan to prepare something special for dinner.

B: Is he even here?

B'. I don't even know if he is here.

(126) A: Did Olivia get the Fields Medal?

B: Is she even a mathematician?

B'. I don't even know if she is a mathematician.

And as we saw with Wh-questions, Y/N-questions with our *even* also contain an actual question, which can be moreover answered:

(127) 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:

(128) a. I don't know if it is warm-blooded =>

b. I don't know if it is a mammal

And this contextual entailment, as with *Wh*-questions, can be diagnosed with the *let alone* test<sup>24</sup>:

(129) 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?)

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<sup>24</sup> And as before, the ordering matters again (see footnote 17):

(i) B': # I don't even know if it is a mammal, let alone if it is warm-blooded.

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:

- (130) 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? <sup>25</sup>

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 (131) extends to the Y/N-case.

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

Consider (119) again:

- (132) A: Let's get 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

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

background questions, which are the questions one needs to know the answer to be in a position to address the QUD. Given the current QUD, *Let's get Joan to prepare something special for dinner*, B needs to know quite a lot of things, "the background list":

(133) The background list:

- a. Joan is here
- b. He<sup>26</sup> can cook
- c. He is willing to cook
- e. Among the dishes he cooks there are dishes we like
- d. We have the necessary ingredients
- g. We are going to have dinner at home

Corresponding questions would form the set of BQs:

- (134) a. Is Joan here?
- b. Can he cook?
  - c. Is he willing to cook?
  - d. Of what he cooks, what do we like?
- etc.

This is parallel to the set of background questions we were dealing with in the Oleana's example. In a similar way, in the *Joan* example the speaker asks *Is Joan here?*, (one of) the least

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<sup>26</sup> This is Catalan *Joan*, a male name, and not the English female name.

likely question 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:

(135) A: Let's meet at Oleana's for dinner. Is that ok?

B: #What is the name of the chef even?

The same effect emerges in the yes/no case<sup>27</sup>:

(136) A: Let's get Joan to prepare something special for dinner.

B: #Will he need a meat grinder even? We don't have any.

B': #Will he even need a meat grinder? We don't have any.

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 yes/no questions as well. However,

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<sup>27</sup> 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:

(i) A: Let's get Joan to prepare something special for dinner.

B: Will he need a meat grinder? We don't have any.

our *even* also shows a few peculiarities when it appears in Y/N-questions, which are discussed in the next section<sup>28</sup>.

## **XII. Reacting to presuppositions in Y/N-questions with our *even***

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. We would expect to be able to observe the same effect with our *even* in Y/N-questions. Here is (118) again:

(137) A: Is this creature a mammal, you think?

B: Is it even warm-blooded?

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<sup>28</sup> 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.



B conveys that he 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<sup>29</sup>. By scalar entailment, B signals that he 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 QUD<sup>30</sup>.

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<sup>29</sup> Why is *Is it warm-blooded?* among the least likely questions to be asked? In the Wh-case we concentrated on, A presumes that B knew enough about Oleana's to know whether she wants to go there and B, by her response, signals that she does not know the most thing about Oleana's. *Ceteris Paribus* for the Y/N case. In (137), A presumes that B knows enough about the creature to be able to say whether it is a mammal. 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.

<sup>30</sup> We already saw that it is possible to answer the QUD in such cases but on grounds other than background knowledge.

(i) A: Shall we go to Oleana's?

B. Sure. We can go wherever you want but where is that even?

The same holds for Y/N questions:

We conclude therefore that the same mechanism that generates the ‘presupposition correction’ contribution of our *even* in the *Wh*-case is also at work at the Y/N-case.

However, there are also two apparent differences between our *even* in *Wh*-questions and in Y/N-questions. The hope is that the differences 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 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 (118) again and remember that mammals are a proper subset of warm-blooded animals.

(138) A: Is this creature a mammal, you think?

B: Is it even warm-blooded?

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(ii) A: Shall we get Joan to cook something for us?

B: Sure \*(but) is he even here?

Therefore, in (138), 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:

(139) A: Is this creature a mammal, you think?

B: I don't even know if it's warm-blooded.

And the same holds with (119). Joan would have to be here for him to be able to cook:

(140) A: Let's get Joan to cook us something special.

B: Is Joan even here?

This "basic 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's only B's responses in (142) that have the prerequisite effect. The ones in (141) do not:

(141) A: Let's meet at Oleana's for dinner.

B: Where is that even?

B': What do they even serve there?

(142) A: Let's meet at Oleana's for dinner.

B': Is it even open at this time?

B': Can we even afford it?

So the intuition about questioning a prerequisite comes about when the focused question is a Y/N-question:

- (143) a. [even C] [Q is Joan here]<sub>F</sub>  
b. [even C] [Q is it warm-blooded]<sub>F</sub>  
c. [even C] [Q can we afford it]<sub>F</sub>  
d. [even C] [Q do we have time?]<sub>F</sub>

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:

- (144) [even C] [Q is it warm-blooded]<sub>F</sub>

The answer *no* eliminates<sup>31</sup> the whole set of subquestions of *Is it warmblooded?*, 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’s?* that eliminates the QUD *Shall we meet at Oleana’s for dinner?*

Therefore, we believe that the basic 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).

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<sup>31</sup> Or, to use Rojas-Esponda’s (2014) term, *resolves* them.

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

(145) Where is Oleana's even? -/-> Oleana's is nowhere

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

(146) a. Is Joan even here? → (Maybe) Joan is not here

b. Is it even warm-blooded → (Maybe) it is not warm-blooded

So maybe Y/N-questions with our *even* should be considered a type of rhetorical /biased question after all? As far as we know, the study of bias in questions with *even* has only been orientated towards the cases where the focus of *even* was a constituent of the question and not at cases where the focus of *even* is the entire question:

(147) Can Mary solve even [the easiest problem]<sub>F</sub>?

→She cannot solve the easiest problem

We hope we can do this in the future. Even so, we would like to end this section by discussing a possible analysis to the negative bias in Y/N-questions (again, with or without our *even*), but also a shortcoming to this analysis.

You may not know the location of a restaurant without there being a potential disagreement with the speaker who assumes that you did. 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; ~p}. In the case of (119):{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/ ~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. 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.

(148) 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 they do not carry horseradish vodka today. The response of C 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 one. So more work needs to be done on the relationship between our *even* and biased questions.

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

(149) 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. If this could be concluded, we would be home free, because we would have one less difference between Wh-questions and Y/N-questions with our *even* to worry about.

However, this conclusion may not be as straightforward as we would like. Indeed (149B), 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<sup>32</sup>.

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<sup>32</sup> In case the reader is tempted to think that (149B) functions basically as a Y/N question with the meaning 'Is he tall enough?', we would like to point out that *yes* or *no* are not possible answers (149B).

So unfortunately, the right answer to if and why (or why not) Wh-questions can give rise to a negative bias, remains elusive.

### **XIII. 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 questions. Some question-embedding verbs block its use.

(150) #She knows where Tunica is spoken even

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

(151) a. She asked where Tunica is spoken even.

b. She asked where Tunica is even spoken.

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

b. She wants to know where Tunica is even spoken

One wonders of course whether (151)-(152) contain garden variety *even* or our *even*. Here



languages like Russian come to the rescue<sup>33</sup>. Russian allows for both *voobščē* and *daže*, as shown in (152):

(153) Volodja (daže) sprosil (daže), gde ego drug.  
V DAŽE ask-PST.M DAŽE where his friend  
'Volodja even asked where his friend is'

(154) Volodja sprosil, gde voobščē ego drug.  
V ask-PST.M where VOOBŠČE his friend  
'Volodja asked where his friend is even'.

In (153), *daže* associates with the embedded question, indicating that among different things Volodja could ask, the question 'where is my friend' is the least likely, according to *the speaker's* judgement. (154) says that the same question is the least likely to be asked with respect to Volodja's (that is, *the subject's*) ranking of background questions. Crucially, moreover, it is only (154) that has the ignorance inference characteristic of our *even*. And equally crucially, this ignorance is subject-, not speaker-oriented<sup>34</sup>.

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<sup>33</sup> It is difficult to construct a Greek counterpart of (153).

<sup>34</sup> As we said earlier in the paper, we do not know what the lexical choice for the different *evens* in languages like Russian can reduce to. Hence we do not know why focusing of the embedded question by *daže* in (153) cannot yield the meaning of our *even* any more than we know why focusing a matrix question by *daže* fails to do so.

We conclude then that our *even* can occur in embedded questions sometimes, but of course, 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 (150) 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 is ready to accept the existence of speech act operators in the syntax whereby, for example, matrix questions are formed by the QUEST operator<sup>35</sup>. As Manfred

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We should also note that we derived extreme ignorance as a conversational implicature. When this is cancelled, the remaining difference between (153) and (154) is the speaker versus subject-orientation.

<sup>35</sup> Sauerland (2009) decomposes the question speech act operator into two parts: an imperative part (“Imp-2”, where “2” expresses addressee-orientation) 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* scopes over both parts of the decomposed question operator or in

Krifka (p.c.) pointed out to us, given that our *even* focuses 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 operator whereas predicates like *know* only take ‘question roots’ as their complements. If Krifka is right, the unavailability of our *even* under *know* follows.

How can we distinguish between the ignorance-compatibility-based account versus the speech act operator based account for the contrast between (150) and (151)-(152)? One possibility is to find predicates that do not embed speech act operators, but are compatible with ignorance. Reversely, we should look for question operator embedding verbs that are incompatible with ignorance. One member of the first class may be the predicate *don't know*, which by Krifka's tests behaves like *know*<sup>36</sup>, yet it is compatible with ignorance, in fact, it asserts it. So can *don't know* embed a question focused by our *even*? The judgment is that *don't*

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between. We leave this for a different occasion, however, as it is unclear to us what the alternatives of *imp* would be, nor the alternatives to CG.

<sup>36</sup> Specifically, 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

*know* behaves like *ask* in (153)-(154). That is, there is a speaker-oriented scale and a subject-oriented scale, the first one surfacing with *daže*, the second with *voobščē*:

(155) Volodja (daže) ne znal (daže),gde ego drug.  
V DAŽE NEG know-PST.M DAŽE where his friend  
'Volodja even asked where his friend is'

(156) Volodja ne znal, gde voobščē ego drug.  
V NEG know-PST.M where VOOBŠČE his friend  
'Volodja asked where his friend is even'.

If this is correct, then 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 than we do, and therefore, we leave this issue for a different occasion<sup>37</sup>.

#### **XIV. Conclusions**

In this paper we discussed a phenomenon that appears when *even* occurs in questions. Specifically, we saw that there is an inference of extreme ignorance projected onto the speaker.

We attempted to reduce 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 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 any other questions.

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* different from Wh-questions. The differences revolve around two conversational impacts that arise in Y/N-questions but not in Wh-questions: With the Y/N-question we indicate that we do not know if the most basic prerequisite of the topic under discussion holds. With the Y/N-question we indicate a bias towards a negative answer. Both of these additional impacts are (hopefully) reducible to the fact that we are dealing with a Y/N-question.

We also saw that in different languages, the choice of lexical item matters for our *even* to appear but we did not explore the specifics underlying the choice in any depth.

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