

## Minimizers — Towards pragmatic licensing

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### 1. Introduction

Pragmatic theories of the licensing of negative polarity items (NPIs) have gained popularity in recent years. However, none of the existing accounts pays much attention to the distinction between weak and strong NPIs. The present paper aims to remedy this by providing a pragmatic analysis of minimizer NPIs, which are traditionally treated as strong NPIs. We will argue that explaining the more restricted distribution of strong NPIs in terms of a *hidden even* operator cannot succeed since *hidden even* would also predict NPIs to be able to occur in downward-entailing contexts such as in the scope of *few*. Therefore, a *hidden even* operator successfully captures the licensing of weak NPIs. Minimizer NPIs, however, require an additional antiveridicality condition to be licensed.

The paper is organized as follows: in the remainder of this section, we will briefly introduce the notions of weak and strong NPIs, and the special case of minimizer NPIs. We will then survey previous pragmatic accounts of NPI licensing, with special emphasis on their treatment of weak vs. strong NPIs where it exists. In section 2, licensing by *hidden even* is discussed in more detail, as this is what most pragmatic accounts assume to be relevant for the licensing of strong NPIs. Section 3 shows that *hidden even* serves as a good licenser of weak NPIs, but cannot account for restrictions in the distribution of minimizers. We will show this in particular for the scope of *few*, *only*, and universal quantification in section 4. Our proposal is spelled out in section 5. We propose that an antiveridicality condition is necessary to exclude minimizers from those contexts. Section 6 concludes the paper and poses open questions.

Negative polarity items have been shown to obey context restrictions of different strength. Weak NPIs can occur in all downward-entailing contexts (Ladusaw, 1979, Zwarts, 1998, van der Wouden, 1997) and include the most widely used items *ever*, *any*, and *any*-prefixed indefinites. Strong NPIs are more limited in use. In the course of the paper, we will focus on three licensing contexts in particular which license weak NPIs, but prohibit strong ones: the scope of *few*, *only*, and universal quantification. The contrast between weak and strong NPIs is contrasted in (1.) through (3.):

- (1.) a. *Few students read any of the assigned papers for my class.*  
b. *\*Few students lifted a finger for my class.*
- (2.) a. *Only Mary read any of the assigned papers for my class.*  
b. *\*Only Mary lifted a finger for my class.*
- (3.) a. *Every student who read any of the assigned papers for my class got an A.*  
b. *\*Every student who lifted a finger in my class got an A.*

The strong NPI *lift a finger* is not licensed in these contexts, whereas weak *any* is.

In this paper, we will focus on minimizer NPIs such as *lift a finger*, which denote (sub-)minimal elements on a contextually salient scale. Distribution-wise, they pattern with strong NPIs and are traditionally treated as such in the literature. While the distribution of minimizers is usually captured by logical theories of NPI licensing, analyses in terms of scale based or pragmatic licensing are to date rare and do not, as we will argue, predict the more limited distribution of strong NPIs (cf. e.g. Krifka (1995), who discusses *drink a drop* to illustrate the strong licensing operator **emphatic.assert**). Our paper elaborates on Eckardt (2005) which already proposed that minimizers in weak licensing contexts lead to sentences which make nonsensical statements (see below for details). The present paper discusses in more detail how these nonsensical statements come about.

Various restrictions have been put forward in the literature to account for the limited distribution of strong NPIs: Zwarts (1998) proposes that strong NPIs are only licensed in anti-additive contexts. Heim (1984) demonstrates that strong NPIs in universal quantification require a law-like universal, a condition which cannot be captured by Zwarts' proposal. Guerzoni (2004) focuses on the use of NPIs in questions and shows that strong NPIs necessitate a rhetorical use of questions while weak NPIs do not. Giannakidou (1998, 2001 and following) opens up a wide range of categories of NPIs whose distribution is captured by nonveridicality and antiveridicality conditions of varying strengths. Gajewski (2008) discusses the licensing of strong NPIs like *in weeks* but explicitly excludes minimizers from the scope of his investigation.

Scale-based accounts of NPI licensing go back to Fauconnier (1975) who suggested that negative polarity items serve to relate a sentence to alternative propositions on a scale. The idea is further developed in Heim (1984) who discusses the use of NPIs in the restrictor of universal quantifiers, notably *every*, *always*, and the antecedent of conditionals. Heim points out the contrast in (4.) and (5.) (examples are adapted slightly from the original):

- (4.) *If a restaurant charges so much as a red cent for tap water, it ought to be closed down.*
- (5.) *\*If a restaurant charges so much as a red cent for tap water, its name starts with the letter "L".*

She proposes that NPIs like *a red cent* are licensed by an *even* operator which evaluates how surprising a sentence like (4.) is in comparison to alternatives such as "If a restaurant charges \$2 for tap water, it ought to be closed down". Heim argues that we have intuitions about the surprisingness of law-like conditionals and universals, and strong NPIs are only licensed if the sentence containing the NPI is more surprising than its alternatives. In contrast, we do not have intuitions about how surprising a universal statement is that just happens to be true accidentally. For example, there is no reason to expect restaurants that charge money for tap water to have a name that starts with the letter "L" (or any other letter). According to Heim, this explains the markedness of examples like (5.) – since we do not have intuitions about the surprisingness of (5.), we cannot evaluate whether it is more surprising than its alternatives.

Kadmon and Landman (1993) discuss the semantics and pragmatics of *any* as a domain widener. They propose that *any* is licensed in all those cases where this domain widening leads to a logically stronger utterance content. Since the proposal

mainly addresses the use of *any*, their theory does not make decisive predictions about the licensing of strong NPIs. Krifka (1995) attempts to fill this gap. He proposes a theory in the spirit of Kadmon and Landman (1993) with two distinct parts: one designed for weak NPIs, the other for strong ones. We will focus here on his theory of licensing strong NPIs. Krifka assumes that NPIs give rise to alternative, more narrow properties, which serve to compose alternative propositions. Strong NPIs require the presence of an operator **emphatic.assert** which requires that the proposition expressed is less likely than the conjunction of all of its alternatives. Because the alternatives are ordered by set inclusion, Krifka's analysis is generally classed as another variant of the *hidden even* analysis. We will follow this classification but will come back to the original definition where necessary. Krifka argues that an **emphatic.assert** analysis of strong NPIs restricts them to strong contexts because the operator requires the proposition in its scope to be "extremal across the board". This is a somewhat unexpected additional requirement which has not been discussed in Krifka (1995) or the later literature in any length.

Lahiri (1998) also presents a pragmatic theory of NPI licensing, but does not address the weak-strong distinction. Guerzony (2004) analyses strong NPIs in rhetorical questions and proposes an analysis in terms of *hidden even*. Interestingly, she demonstrates that questions with strong NPIs and questions with *even* show the same rhetorical properties and hence hidden and overt *even* are in match. In Guerzoni (2006) she proposes a syntax-based analysis of weak NPIs and suggests that an additional *hidden even* account might be adopted for strong NPIs. This distinction is motivated by considerations about language change, notably the idea that pragmatic NPI licensing is a transparent, compositional process which then fossilizes into a syntax-based rule system.

Finally, Chierchia (2004, 2006) develops an integrated theory of utterances, alternatives, implicatures, and polarity licensing. He assumes that alternative computation, triggered by domain widening and other pragmatic processes, can occur at several points in the semantic analysis of sentences. These alternatives can be evaluated according to both logical strength and surprise value (Chierchia (2004) restricts attention to logical strength, whereas Chierchia (2006) also allows for a *hidden even* operator). Chierchia further assumes that the operators can communicate with the NPIs via a feature mechanism in syntax. The restrictions on these operators remain rather implicit; essentially it is proposed that operators and alternatives can occur freely at LF, and that a sentence with an NPI is licensed whenever *some* constellation of operators licenses the NPI. Chierchia (2006) can be viewed as a rich and powerful toolkit of licensing mechanisms, and perhaps not as a concise theory which explains or predicts certain delimitations in the distribution of particular subclasses of NPIs – in fact, the distinction between weak and strong NPIs is not mentioned in Chierchia (2006).

One might assume that since *hidden even* is part of the account, it can do its job for strong NPIs as in everyone else's theory. However, we will show in section 3 that a pragmatic analysis in terms of *hidden even* is not suitable to exclude strong NPIs from weak contexts. To show this, we will spell out a version of the *hidden even* analysis in the following section. As far as we can tell, it does justice to all previous analyses; we will turn to the details of those previous analyses where they differ.

## 2. Hidden even – a working version

All pragmatic accounts of strong NPIs rest on the assumption that (strong) NPIs have a certain pragmatic potential: They give rise to alternatives which have to be interpreted/evaluated by a *hidden even* operator. This operator presupposes the truth of certain scalar requirements, namely that the proposition expressed be more surprising (i.e. less likely) than its alternatives. Consequently, an NPI is *not* licensed if the context is such that those scalar requirements can never be true (technically, we predict contradictory sentences, not ungrammaticality). The markedness of nonlicensed NPIs in an utterance is commonly explained by the fact that the speaker volitionally chooses a pragmatically marked expression instead of a neutral one, when the context is such that the pragmatic effect – presuppositions – necessarily lead to a false statement.<sup>1</sup> The following example illustrates this:

- (6.) \*Tom lifted a finger in my class.  
 ALT(S) = {Tom did the minimum requirements to pass my class;  
 Tom did a lot of work to do well in my class;  
 Tom did a lot of work and finished some extra credit assignments for my class}

If Tom did a lot of work in my class, he also did the minimum requirement. Likewise, if Tom did a lot of work and extra assignments, he also did the minimum requirements. Therefore, all  $p$  in ALT(S) entail S, which is hence the least likely among the alternatives. The presupposition of (hidden) *even* is violated, and (6.) is predicted to be marked. The same oddness arises if we insert overt *even* and replace the NPI *lift a finger* with a non-NPI expression such as *did the bare minimum to pass my class*:

- (7.) \*Tom even did the bare minimum to pass my class.  
 ALT(S) = {Tom did a lot of work to do well in my class; Tom did a lot of work and finished some extra credit assignments for my class}

Again the alternatives are less likely than the reported proposition, as they are all included in those cases where Tom achieves the bare minimum.

Thus, the *hidden even* account proposes that strong NPIs are licensed according to the mechanism described in the two steps below:

- Step 1. Assume that  $S$  is a sentence with an NPI. Assume that it is a lexical property of NPIs to evoke certain more restricted alternatives that could replace the NPI.  
 $S = \text{No one lifted a finger.}$   
 $\text{ALT}(\text{lift a finger}) = \{ \text{'lift a finger'}, \text{do } P_1, \text{ do } P_2, \dots \mid P_1, P_2, \dots \subset \text{'lift a finger'} \}$   
 where the alternatives  $P_1, P_2, \dots$  are linearly ordered by set inclusion; and their union is properly included in the denotation of the phrase.<sup>2</sup>
- Step 2. Let ALT(S) be the set of propositions that arises if the NPI denotation is replaced in the semantic composition by one of its alternatives:  
 $\text{ALT}(S) = \{ \llbracket S \rrbracket, \llbracket S(P_1) \rrbracket, \llbracket S(P_2) \rrbracket, \dots \}$   
 Lexical requirement of NPIs: An NPI is felicitous in  $S$  only if  $\llbracket S \rrbracket$  is less

<sup>1</sup> A lay paraphrase of this kind of ungrammaticality could be "the speaker could have known that this was going to be wrong!"

<sup>2</sup> The restriction is motivated in section 5.2., where we also propose a slightly weaker requirement on ALT.

likely, more surprising than any of the other alternatives  $\llbracket S(P_i) \rrbracket$

The requirement in Step 2 is tantamount to the presuppositions that are raised by *even* in the sentence “*even S*” with a focus on the NPI (“*even S*” is more surprising than any of its alternatives  $S(P_1)$ ,  $S(P_2)$  etc.). Note that *hidden even* takes highest scope. It is hence in concord with the scope analysis for overt *even* (cf. Wilkinson 1996) and does not make specific predictions for NPIs in embedded contexts. While we are not concerned with such examples in this paper, a scope taking mechanism for *hidden even* could (and should) in principle be added.

Having spelled out a version of licensing NPIs through *hidden even*, we will now show that this analysis predicts NPIs to be licensed in the scope of downward-entailing operators such as *few*, and we will conclude that while *hidden even* can serve to license weak NPIs, it cannot predict the more restricted distribution of minimizer NPIs.

### 3. *Hidden even* is not what makes you strong

In this section, we argue that the presuppositions triggered by *hidden even* are satisfied in all cases where the associated element is in a downward entailing or strawson DE context. This means that a *hidden even* analysis predicts licensing in all downward entailing contexts (= the typical distribution of weak NPIs) rather than restriction to anti-additive contexts (= the typical distribution of strong NPIs, including minimizers). We will first offer the general argument and then discuss a few prominent examples.

In the simplest case, downward entailingness is a property of functions from sets  $\langle \alpha, \iota \rangle$  to propositions. We will write them as  $S(P_1)$ ,  $S(P_2)$  to indicate that some property  $P$  is part of the meaning of a sentence.  $S(P)$  is a downward entailing context for property  $P$  iff for all  $P_1 \subset P$ :  $S(P) \rightarrow S(P_1)$ . According to standard argumentation (e.g. Krifka, 1995) logical strength is related to probability in the following way: If  $S \rightarrow T$ , all situations in which  $S$  is true are also situations in which  $T$  is true. However, there might be  $T$  situations which fail to make  $S$  true. Hence  $T$ -situations are at least as frequent as  $S$ -situations (and maybe more frequent). In other words,  $T$  is at least as likely as  $S$ , perhaps more likely still. We can now apply this argument to downward entailing contexts  $S(P)$  and find that the proposition  $S(P)$  is less likely than all propositions that arise from  $S$  by replacing  $P$  by a more narrow property  $P_1$ : for all  $P_1 \subset P$ ,  $S(P)$  is less likely than  $S(P_1)$ .

Let us turn to the alternatives that are at stake when we consider the pragmatic effects of (strong, minimizer, or weak) NPIs. Typically, we compute alternative propositions  $ALT(S)$  on basis of alternatives to minimizers, indefinite NPs, etc. Let us call these  $P_1$ ,  $P_2$ , and so on. These are ordered by set inclusion (according to our Step 2), and at least are all included in the denotation of the NPI (weaker theories, e.g. Chierchia 2006). Take a sentence  $S(NPI)$  with NPI in a downward entailing context. If we replace  $\llbracket NPI \rrbracket$  by one of its alternatives  $P_1$ , we will predict that  $S(NPI) \rightarrow S(P_1)$ . Applying the above argumentation, we can infer that the original NPI sentence  $S(NPI)$

is less likely than any of the alternative propositions in  $ALT(S)$ . Hence, the presupposition triggered by (hidden) *even* will necessarily be true. Therefore, a *hidden even* analysis of NPI licensing predicts that all NPIs that are subject to this kind of licensing are acceptable in all downward entailing contexts. This prediction is correct for weak NPIs, but not for strong NPIs, including minimizers.

The following example illustrates this general principle for *few* as a licenser (read *few* = *few-or-none*).

(8.) If  $P_1 \subset P_2$ , then  $FEW(Q)(P_2) \rightarrow FEW(Q)(P_1)$ .

Assume that we are in a scenario where people can only read a paper once they have downloaded it. Hence,

READ THE PAPER  $\subset$  DOWNLOAD THE PAPER

(9.) FEW STUDENTS DOWNLOADED THE PAPER  $\rightarrow$  FEW STUDENTS READ THE PAPER.

Applying the same reasoning as above, we can infer that it is more likely true that *few students (and not more) have read the paper* than that *few students (and not more) have downloaded the paper*. (Intuitively, you might say that since having the property *download the paper* is easier to accomplish than *read the paper*, it is more surprising when only a small number of students has it). We can also test whether overt *even* makes a coherent contribution to the sentence. This is indeed the case.

(10.) *Few students even downloaded the paper.*

A frustrated instructor can utter (10.) to express surprise that only a small number of students (“*few*”) has managed to have a wide property such as *download the paper*, since in view of its alternatives, it is the most likely one they will have.

Generally, if an NPI is licensed by *hidden even*, the analysis will predict that it is licensed in the scope of *few*. If a minimizer NPI like *lift a finger* is supposed to be licensed by *hidden even*, the analysis makes the prediction that sentences of the form  $FEW(Q)(\llbracket lift a finger \rrbracket)$  should be acceptable. This prediction is wrong, as shown in (1.).

The same predictions can be derived for contexts which are Strawson DE (von Stechow, 1999). It can be observed that some contexts license *any* (and other weak NPIs) even though they are not straightforwardly downward entailing. *Only* is such an example.

(11.) *Only John downloaded the paper.*

(12.)  $\not\rightarrow$  *Only John read the paper.*

Given that (12.) presupposes that John read the paper, we cannot infer (12.) from (11.). Von Stechow (1999) introduces the notion of Strawson-downward-entailment to capture these examples. A context  $S(P)$  is Strawson DE iff for all  $P' \subset P$ ,  $S(P)$  together with the presuppositions of  $S(P')$  entails  $S(P')$ . In the given example, we are in fact allowed to conclude that *only* John read the paper so long as we know that the

presuppositions of the sentence are true (i.e. we have to have independent evidence that *John read the paper* is true).

- (13.) a. Reading the paper is only possible after downloading it.  
b. John read the paper.  
c. Only John downloaded the paper.  
=> Only John read the paper.

Thus, Strawson downward entailment prevents us from jumping to hasty conclusions. Only if it is independently known that John actually read the paper and that he was the only one to download it are we allowed to conclude that he was the only one who read it.

Let us next show how this semantic property of contexts interacts with likelihoods, and a *hidden even* analysis of NPIs in the scope of *only*. We will have to estimate the relative probability of the following two propositions (given the assumption that the paper can only be read once it has been downloaded).

$S(P_1) = \text{Only John downloaded the paper.}$   
 $S(P_2) = \text{Only John read the paper.}$

We can at least infer the following logical relation between  $S(P_1)$ , the presupposition of  $S(P_2)$ , and  $S(P_2)$ :

$\text{Only John downloaded the paper} \rightarrow (\text{John read the paper} \rightarrow \text{Only John read the paper})$

What we can say nothing about is the likelihood with which John will read the paper, once he has downloaded it. However, we could adopt von Stechow's strategy and assume that it only makes sense to ask about relative likelihoods under the assumption that the presuppositions of  $S(P_2)$  are true, i.e. if it is known that John read the paper. By propositional logic, the above is equivalent to the following.

- (14.)  $\text{John read the paper} \rightarrow (\text{Only John downloaded the paper} \rightarrow \text{Only John read the paper})$

In prose, if we restrict attention to the set of worlds where John read the paper, it is less likely that *Only John downloaded the paper* is true than that *Only John read the paper* is true. This is plausible: John might be the only one who actually *read* the paper while others downloaded it as well. Therefore '*Only John downloaded the paper*' is wrong in more contexts than '*Only John read the paper*'.

If this kind of likelihood estimation relative to a restricted set of worlds is possible, we'd expect that overt *even* can make use of it. For instance, overt *even* should be good to express surprise that only John managed to complete a simple task such as download the paper:

- (15.) *Only John even DOWNLOADED the paper.*

Some English speakers report that they do not accept (15.) whereas the German counterpart in (16.) is acceptable. (*Nur* is exchanged for its lexical variant *lediglich* because the joint use of *nur* and *auch nur* in the same sentence leads to stylistic infelicity.)

- (16.) *Lediglich John hat den Artikel auch nur heruntergeladen.*  
only John has the paper even downloaded  
'Only John even downloaded the paper'

The markedness of the English example might be due to position of *only* relative to its associate ('*John*'). Interestingly, we find syntactic variants of (15.) which are quite common. It is easy to find sentences like the following on GOOGLE:

- (17.) *He was the only estimator who even bothered to raise the hood of my car.*

The logical structures of (15.) and (17.) are the same in all important aspects.

We conclude that *hidden even* in association with NPI alternatives can give rise to true presuppositions in Strawson-downward-entailing contexts as well as in simple downward-entailing contexts. Therefore, a theory of NPI licensing on basis of *hidden even* predicts NPIs to be acceptable in those contexts. This prediction is wrong: Clearly, *hidden even* is not what makes you strong.

#### 4. What can and cannot be true

In the preceding section, we argued that NPI licensing by *hidden even*, together with the standard assumptions about alternatives of minimizers, leads to the prediction that minimizers should be acceptable in all downward-entailing contexts. While this prediction is borne out for weak NPIs (*any, ever*), it is wrong in the case of minimizers.

Our argument was based on logical properties of downward-entailing contexts and standard correspondences between logical strength and likelihood. What the argument showed is that many of the reported intuitions about strong NPIs/minimizers are not warranted by their standard semantic analysis (e.g. Heim's proposal that we only have intuitions about laws; Krifka's (1995) intuition noted in passing "that strong NPI sentences need to be extremal across the board", etc.). The present section, therefore, returns to an assessment of intuitions about minimizers — specifically intuitions about non-licensed use. We will summarize what we suspect is the cause for their prohibition from weak contexts. These intuitions serve as our starting point in the formal analysis in section 5. We use the minimizer *lift a finger* in English as our test example.

It is a known fact that *lift a finger* is licensed under negation.

- (18.) *Nobody lifted a finger.*  
(19.) *Otto didn't lift a finger.*  
(20.) *Otto never lifted a finger.*

These examples are well-formed. It is part of their meaning that they do not entail in any way that someone might have lifted a finger — metaphorically or literally, in isolation or as part of some larger activity. Intuitions differ when we consider *lift a finger* in weak licensing contexts like the following.

(21.) ?*Only Otto lifted a finger.*

We use ? to represent the markedness of the example. According to our intuition, the example isn't simply ungrammatical but gives rise to the strange impression that Otto is literally claimed to have lifted a finger. And this is a strange thing to say. We will use ? to indicate this intuition. Similarly, (22.) seems to imply that at least some students lifted a finger, and (23.) that Otto at least sometimes lifts a finger.

(22.) ?*Few students (even) lifted a finger.*

(23.) ?*Otto rarely lifted a finger.*

We will take these intuitions seriously and aim to turn them into a formal criterion to exclude minimizers from weak contexts. This will turn out to be a quite tedious task, and we therefore want to start by addressing one simple alternative explanation which, as we argue, does *not* yield a coherent analysis.

One simple explanation might look like this: “(21.) presupposes the proposition ‘Otto lifted a finger’ (e.g. Rooth, 1992, Beaver and Clark, 2008). This proposition would be expressed by the English sentence “*Otto lifted a finger*”. The latter sentence is ungrammatical. Therefore, (21.) presupposes an ungrammatical sentence. Hence, it is ungrammatical itself.” This kind of reasoning is, however, invalid because the same argumentation applies to sentences which are acceptable. Consider (24.).

(24.) *Only Otto had any money.*

Once again, the sentence presupposes that the proposition expressed by “*Otto had any money*” is true. Once again, this sentence is unacceptable in English. By analogy to the above example, we should conclude that (24.) itself must be unacceptable as well. But in fact, the sentence is fully grammatical. This invalidates the simple explanation. We will have to look for a different way to make use of the intuitions we started with.

We will elaborate the following view: Expressions with minimizers not only give rise to alternatives and require *hidden even* to discharge them (like all other NPIs). They moreover denote properties which can never obtain in isolation. For instance, Otto might actually lift a finger as part of some more substantial activity but the real world contains no isolated eventualities of Otto lifting a finger (see Eckardt 2005, 2007 for a formal implementation). In order for a minimizer to be acceptable, not only should the overall sentence context be suitable for *hidden even* (e.g. downward entailing, as shown in section 3) but we moreover have to take care that no odd contents are asserted. We think that the problem in (21.) is not the proposition ‘Otto lifted a finger’ by itself but the additional side message that ‘Otto lifted a finger and did not do anything beyond this’.

Of course we do not want to claim that all sentences that report odd or contradictory states of affairs are automatically ungrammatical. (21.) is odd because the speaker

holds a belief about the actual world  $w_0$  that cannot be true, and the speaker should know so. We assume that it is part of the linguistic knowledge of competent speakers that a minimal activity like ‘*lift a finger*’ only got lexicalized in order to make certain scalar statements, but the possibility to truthfully report on the isolated occurrence of such an event in the actual world  $w_0$  never arises. Hence, whoever utters (21.) seems to lack knowledge about English that is part of the joint lexical knowledge of the community of competent speakers of English.

At first glance, these intuitions seem to bear some similarity to Giannakidou’s terms *veridicality*, *non-veridicality* and *anti-veridicality* (see Giannakidou 2011:1674 f. for an overview). A sentence-embedding context  $S(p)$  is veridical if  $S(p)$  entails or presupposes that  $p$  is true.  $S(p)$  is nonveridical if it allows no inferences about the truth of  $p$ . One might be tempted to describe intuitions for (21.) as follows: (21.) is veridical for the proposition  $p =$  ‘Otto lifted a finger’, and therefore unacceptable. However, a systematic analysis of minimizers in various contexts in terms of veridicality seems at least not obvious. First, not all contexts at stake are proposition-embedding contexts. For instance, *few students lifted a finger* is not composed by embedding  $p =$  *some student lifted a finger* under any operator. Hence, a Giannakidou style analysis would have to be based on a broader requirement that  $S$  is ungrammatical if it entails  $p =$  ‘some student lifted a finger’, no matter whether  $p$  is literally embedded in  $S$  or not. But this is again problematic because there are many sentences  $S$  which entail  $p$  and are still fully grammatical. For instance,  $S =$  *All students worked hard* entails that *Some student lifted a finger*; in fact they all lifted their fingers and more. The dangerous side message in (21.), (22.) and (23.) seems to be that someone *lifted a finger and did not do anything beyond*. This side message doesn’t play a role in Giannakidou’s work but will be at the core of our proposal.

We deliberately use the term “side message” because, as our examples will show, such side messages can arise in a number of different ways. Technically speaking, they often look like implicatures but unlike implicatures, the hearer does not standardly cancel them when the conveyed message is contradictory. The analysis is moreover not (yet) based on any nameable uniform logical property which distinguishes weak and strong contexts. In the next section, we discuss side messages of scalar statements with *only*, *few*, universal quantification, and conditionals.

## 5. Scalar statements and their side messages

In this section, we will explore how various scalar statements carry a side message that “not more happened than this”. Eventually, we aim to apply our findings to sentences with minimizers but we cannot use those to test our intuitions. The respective sentences are first and foremost ungrammatical, which makes all intuitions about entailments or implicatures questionable. We will therefore consider sentences with overt *even* in the same structural positions as we would expect a *hidden even*, and with focus alternatives which share the inclusion properties of NPI alternatives. Such sentences share the pragmatic features of sentences with minimizers but are acceptable and therefore can be evaluated for their side messages.

### 5.1. *few*

We will base our discussion on the sentence in (25.).<sup>3</sup>

(25.) *Few students even downloaded the paper.*

(25.) contains overt *even* which associates with the property denoted by its sister constituent “downloaded the paper”. Let us assume that (25.) is used in a situation where the salient alternatives are “read the paper” and “understand the paper” and where, moreover, students have no other access to the paper than by downloading it. Hence, the three alternatives are ordered by set inclusion:

$$\begin{array}{l}
 P_1 = \text{DOWNLOAD} \\
 \cup \\
 P_2 = (\text{DOWNLOAD and READ}) \\
 \cup \\
 P_3 = (\text{DOWNLOAD and READ and UNDERSTAND})
 \end{array}$$

The expression *download the paper* occurs in a downward entailing context. The presuppositions triggered by *even* in this example are coherent, and the sentence is fully acceptable (as was already argued in section 3). (25.) carries the following side messages.<sup>4</sup>

- Existence:* ‘Some students downloaded the paper’
- Implicature:* ‘Not many students downloaded the paper’
- Upper limit:* For all more narrow alternative properties *P*’ at stake: Even fewer students did *P*’.

*Existence* is an implicature which arises because the speaker has a choice between *no* and *few*. If s/he believed that in fact *no student* downloaded the paper, s/he would be obliged to say so. Hence, the hearer understands that the speaker does not believe that *no student* downloaded the paper. If we disregard the case where the speaker has imperfect knowledge, this leads to *existence*.

*Upper limit* is a more controversial side message. It seems to have more to do with the rhetorical point the speaker in (25.) intends to make. Scalar assertions like (26.) appear to come with an understood afterthought “...and that is about the best that can be said about how they performed”. Specifically, we understand that an assertion about *more students* would have been a more pleasant thing to report, and *doing more than just download* would likewise have been a better thing to report in answer to the question “How did the students do?”.

In natural situations where (25.) is uttered with this evaluative side message, the possible alternative reports are not linearly ordered. For instance, (26.) shows two propositions which arise as alternatives in (25.).

- (26.) ‘Few students downloaded the paper’  
 ‘Two students commented the paper’

<sup>3</sup> To complement our example, consider the following real sentence from GOOGLE:

(1) Few students even know what sociolinguistics is.

<sup>4</sup> We construe the meaning of *few* as *less than n*, possibly 0 for a suitable small number *n*. Otherwise, *few* would not create a downward entailing context.

Typically, “*few students*” are more than “*two students*”, however “*download*” is less of an achievement than “*comment*”. Hence it is not evident which of the two reports should be the more pleasant one.<sup>5</sup> Other reports can be ranked more easily. For instance, (27.a) is a better thing to report than (27.b), and similarly (28.a) is a more pleasant report than (28.b).

- (27.) a. *Few students read the paper.*  
 b. *Few students downloaded the paper.*  
 (28.) a. *Only one student read the paper.*  
 b. *Few students read the paper.*

On basis of these facts about partially ordered possible reports, the afterthought of (25.) can be spelled out as follows.<sup>6</sup>

- (29.) *Few students even downloaded the paper.*  
 (30.) *Few students downloaded the paper*  
*The speaker has no information that would allow her to make any “better” report.*  
*In particular, the speaker has no information that would allow her to report that “Few students READ the paper.”*

Even though the sentence ‘few students read the paper’ may be *semantically* true, the speaker decides that uttering it would be pragmatically misleading or uninformative; most likely because she actually knows that even fewer students read the paper, and that reporting about such a smaller group would require the use of *very few*, or *just one or two*. Hence, the speaker believes that some students only downloaded the paper but did not do anything more substantial. The speaker doesn’t commit to a “better” proposition that could be expressed in terms of the salient alternatives. This is exactly the side message *Upper Limit* above.

We are aware of the fact that our considerations about the side messages of scalar utterances are in part tentative. While we believe that they are warranted by our own intuitions, we feel the need to add some disclaimers. We do not claim that the *Upper Limit* message is a stable component in the meaning of sentences like (25.). Specifically, we grant that the speaker can continue as in (31.) without sounding contradictory.

- (31.) *Few students even downloaded the paper.*  
*Those who did, however, eventually did quite well in understanding it.*

Perhaps such moves are moves in the emotional profile of the discourse. The speaker can dramatize her story and move from a desperate initial state (“...and at that point, this was the best that you could say”) to a more optimistic assessment (“... but then matters cleared up”). Likewise, it might be possible to appreciate even small achievements in a second sentence.

<sup>5</sup> We avoid the qualification *better report* because *better* might be misunderstood as judgment about grammatical or stylistic quality.

<sup>6</sup> The following quote by Randolph S. Bourne offers an attested paraphrase of the intended kind: „Few people even scratch the surface, much less exhaust the contemplation of their own experience.”

- (32.) *Few students even downloaded the paper.  
Well, as a matter of fact, those that did all printed it and put the copy in a nice folder.*

For the purpose of the present paper, we will set these considerations aside. We rely on the afterthought "...and that is about the best that can be said in this matter" and assume that it is at least valid locally, i.e. at the end of the utterance of the sentence.<sup>7</sup> We moreover assume that it gives rise to *Upper Limit* side message which can entail that some agents didn't do much (here: some student(s) just only downloaded the paper). Let us next show that this side message has fatal consequences in sentences with a minimizer in the scope of *few*. Consider the following example.

- (33.) *?Few students hidden even lifted a finger.*

The sentence is parallel in structure to (25.). It has *hidden even* where (25.) uses overt *even* and a minimizer and its alternatives, in the place of the (focused) property and its focus alternatives. The alternatives in both examples are linearly ordered by set inclusion. We argued that such scalar assertions come with the understood trailer "...and that is about the best that can be said in this matter". We showed that this trailer leads to the *Upper Limit* side message which, in this case, spells out as in (34.)

- (34.) 'Few students lifted a finger and some of them didn't do anything beyond that'

Faced with (34.) the hearer will understand that the speaker believes that someone in the real world could do such a thing. The speaker of (33.) hence lacks knowledge about the lexical content of *lift a finger* which is essential for its function and use. *Lift a finger* is a minimizer which associates with *hidden even* and serves to express scalar assertions. It can't report on independent eventualities. In simpler words: the sentence is unacceptable because the speaker's rhetorical point would require her to believe things that a competent speaker of English should not hold possible. We will refer to this restriction as the *No Nonsense* condition for English. It is related to the coherency requirements of *hidden even* accounts, as discussed for instance in Krifka (1995).

## 5.2. Only

Our next case of investigation are the side messages of scalar statements with *only*. Once again, we start by looking at assertions with overt *even* and suitable alternatives. The following offers an example.<sup>8</sup>

- (35.) *Only two students even downloaded the paper.*

<sup>7</sup> It should have become clear that it does not make matters any clearer to call the side message an implicature, or a conventional implicature in the sense of Potts (2005). At the very best, we see it as the explication of the rhetorical point that the speaker intends to make. While rhetorical intentions have elsewhere been discussed as a factor in pragmatics (e.g. in the use of *almost vs. barely*, see Guerrevink et al., 2007), this is not the place to investigate them systematically.

<sup>8</sup> Once again, there are stylistically better variants of (35.) The following is a GOOGLE find: *I was the only one who even dared to stay with Richard Leonard*. For some reason, *only* seems to require a focus in these double-focus examples. Maybe this is the observation that corresponds to Krifka's (1995) intuition that extremal statements need to be extremal "across the board".

We found that speakers of English find it hard to accept (35.) without context. Therefore, we will briefly pause to discuss its contextual restrictions. The sentence does not serve to convey neutral information but serves a particular function in the overall discourse: the sentence is best as an elaboration (or argumentation) on a first claim like "*Last week, my class on whale phonology was a disaster.*" As in the examples of the preceding section, we understand a side remark "...and that is still the best that can be reported about it". The example should get better once it is understood as part of such a context.<sup>9</sup> The German translation in (36.) serves the same discourse and rhetorical function, and it is fully acceptable in the appropriate context.

- (36.) Last week, my class on Whale phonology was a disaster.  
*Lediglich zwei Studenten haben auch nur das Paper runtergeladen.*  
Only two students have even the paper downloaded

As before, we will assume a situation where DOWNLOAD is contrasted with (DOWNLOAD and) READ, and (DOWNLOAD, READ and) UNDERSTAND. According to standard analyses, the sentences (36.) and (37.) convey the following information.

*Presupposition:* Two students downloaded the paper.  
*Assertion:* Not more than two students downloaded the paper.

In addition, however, we intuitively understand an *upper limit* side message: 'For all alternatives *P* under debate the speaker wouldn't be able to assert that *two students did P*'. This upper limit message in turn entails that at least one of the students in fact downloaded the paper and didn't do anything else with it.

If we take the rhetorical function of sentences like (35.) and (36.) seriously, we can derive the upper limit side message from standard pragmatic assumptions. Their use is restricted to contexts where the question under discussion is *How did the students perform in my class on Whale Phonology?* The speaker aims to support her claim that the answer is "not very good". The following alternative propositions are therefore relevant.

*Two students downloaded the paper.*  
*Two students read the paper.*  
*Two students understood the paper.*

Had the speaker chosen to utter "*Only two students even read the paper*" she would have triggered the presupposition that two students read the paper. This information would have been relevant. Given that the speaker refrained from giving this information, we can infer that she does not believe it to hold true. Similarly for the strongest proposition 'two students understood the paper'.<sup>10</sup>

<sup>9</sup> Another way to improve (35.) seems a paraphrase like "*Bob and Sue were the only students who even downloaded the paper*", see the Google find in Section 3. Possibly, English *only* cannot associate with a focus on the determiner of a sister DP whereas German *nur* can. This issue needs further exploration.

<sup>10</sup> In that case, the use of *even* might be unwarranted in principle, because "understanding" the paper can hardly be presented as a minor achievement.

The range of pleasant and bad reports is very similar to the one in section 5.1. The speaker faces what could be called a two-dimensional “Horn space” of possible assertions which are partially ordered along the axis *good* — *bad*. While it is open, again, whether it is better to have “*two students download the paper*” or “*one student read the paper*”, the report that “*two students read the paper*” is clearly more satisfactory than that “*two students downloaded the paper*”. The use of *even* indicates that the speaker is aware of these salient alternatives. Hence, we can infer that she volitionally refrained from triggering this stronger presupposition.

It was part of our analysis of *hidden even* that the alternatives in question are linearly ordered by set inclusion (see section 2). This assumption was adopted without further argumentation, and one might wonder whether some weaker condition might also have been sufficient (e.g. that all alternatives  $P'$  of  $P$  are strictly included in  $P$ ).<sup>11</sup> The case of *only* can serve to motivate the more restrictive definition. Consider the following example:

(37.) *Only three students even downloaded the paper.*

Let us assume that the speaker could maintain alternatives like

- $P_1$  = DOWNLOAD and FILE the paper
- $P_2$  = DOWNLOAD and STAPLE the paper
- $P_3$  = DOWNLOAD and READ the paper

These alternatives are not ordered by set inclusion because one can read a paper without filing it, file it without reading it and so on. It could be possible that student  $S_1$  in fact downloaded and filed the paper,  $S_2$  downloaded and stapled the paper, and  $S_3$  downloaded and read the paper. Against this background of alternatives, the entailment that ‘at least one student just downloaded and did nothing else’ has vanished (in fact, each student did more than just download the paper although there is no alternative  $P_1$ ,  $P_2$ , or  $P_3$  that all three did). Such a scenario is no longer possible if linear order is required.

Technically, a slightly weaker requirement on the minimizer alternatives might turn out to be sufficient for all examples.

(38.) Let  $\{P_1, P_2, \dots, P_k\}$  be an arbitrary set of properties which could be stronger alternatives to  $P$  (denoted with a minimizer). Then  $\text{ALT}(P)$  must also contain  $P_1 \cup P_2 \cup \dots \cup P_k$  and this union must be strictly included in  $P$ .

If  $\text{ALT}(P)$  adheres to this requirement, then the *upper limit* message gives rise to the crucial veridicality entailment.

Let us finally show how the upper limit message and its entailments can explain why minimizers in the scope of *only* are marked. Consider an example.

<sup>11</sup> Krifka 1995 adopts the same requirement for alternatives of strong NPIs, and we could hence simply claim to adopt his definition. Surprisingly, however, his eventual explanation of strong NPI licensing does make use of this strong requirement whereas our own theory, as we argue presently, hinges on it.

(39.) *?Only two students ( $\emptyset_{\text{even}}$ ) lifted a finger.*  
*(?Tom and Tina were the only students who ( $\emptyset_{\text{even}}$ ) lifted a finger)*

*Hidden even* is used instead of overt *even* in the preceding examples. Alternatives arise due to the lexical properties of *lift a finger*. We will assume that  $\text{ALT}(\llbracket \text{lift a finger} \rrbracket)$  adheres at least to (38.). Sentence (39.) gives rise to the *upper limit* message “for no alternative  $P$ , the speaker could truthfully utter ‘only two students did  $P$ !’”. We can derive that the speaker believes that at least one student lifted a finger but did not do anything beyond that. Yet, any speaker who believes such a thing has incomplete knowledge about the meaning of *lift a finger*. Therefore the sentence is marked.

Given that our main interest is the markedness of minimizers in the scope of *only*, *few* and other weak licensing contexts, we refrain from a more comprehensive investigation of scalar statements with *even* and *only*. Our examples are tailored to match the *hidden even* examples as closely as possible: for instance, our alternatives were carefully chosen so as to all be subsets of the property denoted by the sister constituent of *even*.<sup>12</sup>

### 5.3. Universal quantification in episodic sentences

Our next case are veridicality entailments for sentences where minimizers are used in the restrictor of a universal quantifier. The minimizer contributes to the description of the quantifier’s first argument  $P$  as in  $\text{ALL}(P, Q)$  and gives rise to alternative, more narrow properties  $P', P'', \dots$ . Given that  $P$  is in a downward entailing context,  $\text{ALL}(P, Q)$  entails all alternative propositions and is therefore the least likely of the propositions at stake. Hence, *even* +  $\text{ALL}(P, Q)$  is coherent, and the base account of *hidden even* licensing would predict that the NPI should be acceptable when in fact it is not.

In order to investigate the possible side messages (implicatures or other) of scalar particles in the restrictor of *every*, let us once again take a look at examples which contain overt *even* in the same structural position. We will also use the same alternative properties as in the preceding sections.

(40.) *Every student who even DOWNLOADED the paper got an A.*

As before, the speaker makes the strongest assertion, hinting at weaker alternative propositions that could have been asserted and which are more likely. We will restrict attention to an episodic use of (40.) where it is used to report on an actual class, and an incidental result of grading. Intuitions change when (40.) is read as a general grading policy of the teacher, and we disregard this second reading here. In the episodic reading, (40.) suggests that the speaker can make this statement because she

<sup>12</sup> This constellation is quite rare, and it is much more common to consider alternatives which are mutually exclusive like caviar and potatoes in a sentence like Tom was the ONLY one who even bought POTATOES. While it would be interesting to test these examples for the “...and this is the best that can be reported in this affair” trailer and to develop a generalized version of the upper limit message, this is beyond the scope of the present paper

knows of at least one or two students who actually didn't do anything beyond downloading the paper and still got an A.

This side message is a variant of Grice's maxim of manner, in interaction with the maxim of quality, which can be seen in action in the following analogous case.

(41.) *Every student who downloaded the paper, or who was the son of a millionaire, got an A.*

If (41.) is uttered as a description of some particular class, the speaker implicates that each of the two disjuncts was non-empty: There were students who downloaded the paper (and maybe nothing else), and there were millionaire sons. Otherwise, the speaker would use an unnecessarily long description of a set that — as she knows — in fact can be described in a shorter manner.<sup>13</sup>

We want to propose a more general pragmatic effect which extends to examples like (40.):

If two sentences  $S(A)$  and  $S(A')$  are alternatives,  $\llbracket S(A) \rrbracket \rightarrow \llbracket S(A') \rrbracket$  and  $A' \subseteq A$ , then the speaker who asserts  $S(A)$  must believe that  $A'$  is a proper subset of  $A$ .

In example (41.), the sentences  $S(\textit{student who downloaded the paper})$  and  $S(\textit{student who downloaded the paper or was the son of a millionaire})$  are salient alternatives. The speaker who makes the longer assertion implicates that she doesn't spend so many words without reason: she believes that there actually were students who were millionaires but didn't download anything.

In the present form, the principle also covers (40.). The use of *even* indicates that the speaker has other alternative properties in mind, e.g.

$P_1$  = DOWNLOAD the paper  
 $P_2$  = (DOWNLOAD and) READ the paper  
 $P_3$  = (DOWNLOAD and READ and) UNDERSTAND the paper

Hence, the following are salient alternative propositions:

*Every student who downloaded the paper got an A.*  
*Every student who downloaded and read the paper got an A.*  
*Every student who downloaded, read and understood the paper got an A.*

Brevity is not an issue here. Unlike in (41.), the actual utterance is optimal in view of brevity. The above principle states that the speaker must therefore believe that her statement — in contrast to the others — is not just incidentally true (and in fact, all these students worked hard on the paper in order to deserve their A) but that she has evidence that downloading-and-nothing-else was the property which earned the good

<sup>13</sup> Or, the statement sounds stronger than it was in actual fact. In spite of the extensive literature on the use of *or*, we know of no formal pragmatic investigation of examples of this kind, even though the effect is quite striking.

grade — which means that there was at least one or two students who downloaded the paper, didn't do anything beyond, and still got an A.<sup>14</sup>

The same principle can help us to understand the observations for minimizers in the restrictor of universal quantifiers. We offer some examples.

(42.) *?Every student who  $\emptyset_{\text{even}}$  lifted a finger got an A.*

The use of minimizers *lift a finger*, *a red cent* gives rise to alternatives. The speaker asserts a universal statement with a very comprehensive restrictor while at the same time indicating that she is aware of the fact that more narrow properties could have been mentioned instead. She is therefore committed to the belief that her use of a comprehensive restrictor was not void, and that there are in fact persons who fall under the most comprehensive property (*lifted a finger*) but who would not have been covered by any more narrow description (e.g. *read the papers*). (42.) hence entails that the speaker believes that the actual world contains at least one student who lifted a finger but did not do anything beyond. As in the previous sections, this is not a belief a competent speaker could maintain.

We carefully distinguished between episodic universal statements and law-like universals and our claims were restricted to the former type. Facts about conditional sentences strongly suggest that laws and rules can include descriptions of counterfactual worlds which can violate the restrictions that we pose on the actual world. In particular, the data show that 'the student who lifted a finger and didn't do more' is a possible protagonist in counterfactual worlds though not in our own. Unfortunately, these intuitions cannot straightforwardly be replicated for sentences with universal quantifiers. It is our impression that examples like (43.) improve with the presence or absence of overt *even* as in (44./45.), an observation that poses a challenge to any version of the *hidden even* account.

(43.) *?Every student who lifts a finger will get an A.*  
(44.) *Every student who even lifts a finger will get an A.*  
(45.) *If a student even lifts a finger, he will get an A.*

The status of these contrasts is not discussed in the literature, neither as an empirical issue nor as one for analysis. We will therefore restrict attention to the contrast between incidental and law-like conditionals (Heim, 1984) and leave it open how the analysis needs to be refined for the case of (structurally similar) law-like universal statements like (43.)/(44.).

#### 5.4. Law-like universal quantification and conditionals

In the present section, we take a closer look at law-like conditionals of the kind in (45.), repeated below, with its German counterpart.

<sup>14</sup> Remember that we are not concerned with the law-like reading of (40.) In that sense, (40.) could be uttered by the teacher of the class while students in fact worked hard, and the extreme case never was instantiated. Note that in the same sense, (41.) does not implicate that there were millionaire students in class — it just asserts that if there were any, then the teacher would have graded them with an A.

- (45.) *If a student even lifts a finger, he will get an A.*  
*Wenn ein Student auch nur einen Finger krumm macht, kriegt er eine 1.*

As in earlier cases, the example can only coherently be used in a discourse which addresses the question “How much work does a student have to do in order to get a good grade?” and as before, the situation described is an extreme endpoint in a two-dimensional space of possible pairings of effort and success. Unlike the quantificational examples of the preceding section, the sentence expresses a law and hence quantifies over the actual and all sufficiently similar counterfactual worlds. Disregarding the contribution of (hidden or overt) *even* for the moment, various theories of conditionals will all yield an analysis which can roughly be glossed as in (46.)

- (46.)  $\lambda w_o: \forall w [w$  is sufficiently similar to the actual world  $w_o \wedge$   
 $w$  adheres to the teacher’s grading policy  $\wedge$   
 ‘a student lifts a finger (to contribute to the class)’ holds in  $w$  ]  
 $\rightarrow$  ‘the student gets an A’ holds in  $w$  ].

This proposition will then be contrasted with alternative propositions of the kind “if a student does *P* to contribute to the class, he will get an *A* in that class”. These are all entailed by (46.) and hence more likely. They are also more likely on intuitive grounds; it is more plausible that a substantial contribution is required to achieve an *A* than that a minor contribution suffices to get an *A*. This confirms that (hidden or overt) *even* leads to a coherent message in the case of (45.). The logical structure of the present example is the same as the one of examples in the previous section and yet, these examples were unacceptable whereas the present example is good.

This contrast tells us more about the speakers’ lexical knowledge about minimizers like *lift a finger* and the properties they denote. So far, we argued that the actual world does not contain eventualities which are described with minimizers unless they occur as part of eventualities which are more substantial, e.g. there cannot be an eventuality of *x lifting a finger* unless it is part of an eventuality where *x* does something more substantial. We assumed this to be part of the speakers’ lexical knowledge about the minimizer (along with the knowledge that it gives rise to alternatives, the knowledge that these should be discharged by *hidden even* etc.). Law-like conditionals show what speakers can *imagine* to happen even though they know it never will. Law-like conditionals, like other generic sentences, are not confined to the actual world. As in section 5.3, the speaker uses the most general proposition *p* (‘*x lifts a finger*’) instead of a more specific *p*’ (‘*x read the papers*’) because she believes that in some cases, the more general description is truly wider than the more narrow description (i.e. there are worlds *w*’ where there are students who lift a finger but don’t do more, and yet get grade *A*). These worlds *w*’ cannot be the real or an epistemically possible world. Laws, however, are defined by what happens in all *deontically* accessible worlds and these can include worlds which violate common knowledge. Hence, the speaker can utter (45.) even though she knows that actually all students did something more than just lift a finger in class (and all got an *A*). The extreme student ‘*x* lifted a finger but did not do more’ will be part of counterfactual worlds which, even though not epistemically possible, are covered by the law in (45.). Hence, in uttering (45.) the speaker is not committed to the belief

that there are *actual* students who lift a finger but do not do more. This explains why minimizers are acceptable in law-like conditionals.

### 5.5. Why Veridicality is not dangerous for Weak NPis

At the outset of the paper we discussed that a *hidden even* analysis is suited to predict NPI licensing in all downward entailing contexts, assuming that all NPis give rise to alternatives which are ordered by set inclusion. It is hence an option to explain all NPI licensing (in assertions) by a *hidden even* account (see Chierchia 2004, 2006) whereas the real challenge lies in explaining how minimizers, if licensed by *hidden even*, are excluded from weak licensing contexts. We proposed that there are illicit veridicality implicatures (or ‘side messages’) which explain the restriction of strong NPis to strong licensing contexts. In this section, we will briefly argue why weak NPis do not fall victim to the same illicit veridicality implicatures (and side messages) in weak contexts.

We share the assumption in the literature that the denotation of *any* is identical to the denotation of *some*, and that the denotation of *ever* is the same as *sometime*. There is nothing special about the denotation of *any* and *ever* although they share the pragmatic properties of other NPis: They give rise to alternatives, and the alternatives get discharged by *hidden even*. Consequently we expect the same side messages for sentences with *any/ever* in the scope of *few*, *only*, *always*, *every* as those that we discussed in sections 5.1. - 5.4. However, these side messages are not excluded by lexical/world knowledge. They correspond to propositions that could be expressed by *some*, *sometime* and could be consistently uttered by the speaker. Let us test this with one example.

- (47.) *Few students had any questions (at all).*

These are the side messages of scalar statements under *few* that we diagnosed in section 5.1.

- Existence:* ‘Some students had a question’  
*Implicature:* ‘Not many students had a question’  
*Upper limit:* For all more narrow alternative properties *P*’ at stake: Even fewer students did *P*’.

Let us assume that these are the alternatives at stake.

- P* = ‘have a(ny) question’  
*P*’ = ‘have several questions’  
*P*” = ‘have several challenging questions’

It is important to note that we are concerned with properties in a logical space, not with sentences or clauses in English. *P* is the property denoted by the phrase *have any question* and also the property denoted by the phrase *have some question*. The use or non-use of *any* in some English expression which happens to denote *P* is not an issue.

The *upper limit* message yields the entailment that *Some student(s) did P but not more*. This means that the speaker is committed to the belief that

*Some student(s) had a question, but they didn't have several questions, or several challenging questions.*

This is a perfectly consistent belief. Therefore, our account predicts that sentence (47.) should be perfectly acceptable, which is correct. Analogous reasoning shows that *ever* is acceptable in the scope of *few*, that *any* is acceptable in the scope of *only* and so on, for all the constellations that we discussed in our paper. Veridicality implicatures and other side messages are not a threat for weak NPIs.

## 6. Summary

The present paper started by demonstrating that *hidden even* licensing makes the prediction that all NPIs are licensed in all downward-entailing contexts, under the sole assumption that all NPIs give rise to alternatives that are ordered by set inclusion. This is surprising in view of the fact that several authors proposed *hidden even* licensing for strong NPIs, assuming that strong NPIs give rise to this kind of alternatives. It has been unclear so far how this kind of approach can explain that strong NPIs are restricted to strong licensing contexts while being excluded from a number of contexts which are downward-entailing (Zwarts 1998, van der Wouden 1997).

Focusing attention to *minimizers*, we reviewed some non-licensed uses of minimizers in downward-entailing contexts and surveyed the intuitions that they give rise to. The examples in question are intuitively odd because they suggest that the speaker wants to say that something impossibly little took place. We proposed that scalar statements in certain downward entailing contexts give rise to implicatures (or other side messages) about minimality statements. We called these *veridicality* side messages but want to stress that we use *veridicality* in a more specific sense than e.g. Giannakidou (1998, 2011).

(48.) \**Few students even lifted a finger in this class.*

The problem of a sentence like (48.) is not its implicature “some students lifted a finger” because they could do this as part of doing something really substantial, like writing an essay, or presenting in class. The problem is that we understand that at least one or two *lift a finger and don't do anything beyond*. We assumed that it is part of our lexical knowledge about minimizers that we know that this cannot happen in the actual world.

We tested intuitions and discussed veridicality implicatures for *few*, *only*, *every*, and for *conditionals* on a case-by-case basis. What remains open at this point is whether they all share some abstract logical or pragmatic property which can offer a positive definition for weak-but-not-strong licensing contexts. Another point that we left open is the nature of the side message that eventually lead to the veridicality implicature. At least some of them look like Gricean implicatures. If that is so, one might ask why they do not get cancelled, as implicatures generally vanish as soon as they are in

evident conflict with other information in the given text. We might speculate that implicatures cannot be cancelled without costs *if* they arise from the use of a particular lexical item (here: a minimizer plus *hidden even*) which gives rise to this implicature in the first place. Specifically, we could argue that

- the use of the minimizer plus *hidden even* gives rise to a scalar statement
- the scalar statement gives rise to dangerous implicatures
- these dangerous implicatures entail impossible propositions
- they therefore need to be cancelled
- which prohibits the use of the source of the implicatures, the minimizer, in the first place.

While this opens a new perspective on the use of items which trigger implicatures, more research on the logic of scalar statements and implicatures in general would be needed in order to lead to a hardwired principle. In the present paper, we adopt a more hypothetical stance: *Assuming* that some such principle operates, we can successfully explain why minimizers are excluded from certain contexts.

## Appendix

While we hope to have shed some light on the licensing of minimizer NPIs, some issues remain open and require further research. One is the observation that minimizers are much more easily licensed in the antecedents of conditional threats than promises (cf. e.g. König 1977, Csipak t.a.). The other is the status of minimizers in imperatives. We will discuss each in turn.

Conditional threats are much better licensors of minimizers than conditional promises:

(49.) *If you lift a finger to hurt him, I will punish you!*

(50.) *?If you lift a finger to help him, I will buy you an ice-cream cone!*

Our approach thus far predicts that both (49.) and (50.) should be acceptable, since both discuss the lifting of fingers in equally remote worlds. Moreover, both are more surprising than any of their alternatives: in each case, it is surprising that a very small action on the addressee's part is enough to make the speaker act on her threat or promise, respectively. However, only the threat is good, while the promise is somewhat odd.

We think that this effect should be connected to van Rooij and Franke's (2010) suggestion that threats are “cheaper” for the speaker than promises. They suggest that threats do not put a strong commitment on the speaker and hence produce little cost; in particular, the addressee will rarely complain if the speaker fails to punish him. Promises, on the other hand, are relatively costly. Not keeping a promise will lower the social status of the speaker, and therefore promises should stay within the limit of the speaker's capacities.<sup>15</sup> This asymmetry between threats and promises could help to understand (49.)/(50.). In (50.) the speaker promises the addressee an ice-cream

<sup>15</sup> Van Rooij and Franke use these assumptions to explain the asymmetric distribution of disjoint imperatives in threats and offers: while (1.) is an effective command to sing, (2.) cannot be used to command the addressee to sing.

(1.) *Sing or I will kill you!*

(2.) *\*Keep silent or I will kiss you! (attempted: Sing and I will kiss you!)*

Van Rooij and Franke attribute the difference to the different social costs of threatening vs. promising.

cone in return for a very small favor. The addressee will claim it even if he only did the very minimum. This makes (50.) very costly for the speaker. In (49.), on the other hand, the speaker utters a threat at close to no cost, and the addressee will be cautioned to behave very well, since the very small offense of lifting a finger already comes with the threat of punishment. As an additional bonus, the speaker will appear generous if she chooses not to punish the addressee after a minor offense. Hence, threats like (49.) are very efficient and "cheap" for the speaker.

The other observation we want to draw attention to is the status of minimizers in imperatives. Imperatives are not downward-entailing and in fact do not license NPIs like *ever* or *in weeks*. German examples do not improve with the use of modal particles (indicated in bold).

- (51.) a. \*Go ever to China!  
 b. \*Geh jemals nach China! (translates a.)  
 c. \*Geh **doch mal** jemals nach China!  
 d. \*Jetzt geh **schon** jemals nach China!  
 e. \*Geh **ja** jemals nach China!

However, it has been anecdotally observed (cf. Csipak 2011) that minimizers are acceptable in German imperatives if the imperatives also contain modal particles. (English imperatives do not license minimizers, perhaps because there are no modal particles in English.)

- (52.) a. \*Lift a finger!  
 b. ?Mach einen Finger krumm! (translates a.)  
 c. Mach **doch mal** einen Finger krumm! (**doch mal** = impatience)  
 d. Jetzt mach **schon** einen Finger krumm! (**schon** = impatience)  
 e. Mach **ja** einen Finger krumm! (stressed **ja** = threatening, 'make sure you lift a finger')
- (53.) a. \*Say a peep!  
 b. ?Sag einen Ton! (translates a.)  
 c. Sag **doch mal** einen Ton! (**doch mal** = impatience)  
 d. Jetzt sag **schon** einen Ton! (**schon** = impatience)  
 e. Sag **ja** einen Ton! (stressed **ja** = threatening, could be 'dare say a peep' or 'make sure you say a peep')

While weak NPI *jemals 'ever'* is not licensed in imperatives, with or without modal particles present (cf. (51.)), minimizers can occur felicitously with a variety of particles: *doch, mal, schon, ja*. While we cannot present a full-fledged account of this phenomenon here, we believe that the approach presented thus far provides a promising line of attack. Other native speakers of German share our intuition that the speaker of (52.) and (53.) is giving a "minimal" order – she would prefer it if the addressee did more (i.e. help more and say more, respectively). The speaker's preferences correlate with the amount of work put in by the addressee: the more work the addressee does, the more the speaker approves. Given this state of affairs, it is more likely that the speaker would ask for a normal-sized amount of work, rather than a minimal one. Thus, uttering (52.) or (53.) is more surprising than uttering an order asking for a larger amount of work.

We are left with two puzzles: why do minimizers require the presence of particles in imperatives in order to be licensed? And why are only minimizers acceptable, but not other NPIs? Answering these questions is beyond the scope of this paper. We can only speculate as to why it is minimizers, but not other NPIs, which can occur in imperatives. Sedivy (1990) observes a similar puzzle in the context of meta-linguistic negation: items like *any* and *ever* cannot occur there, but NPIs with what she calls "lexical content" like *lift a finger* can:

- (54.) A: Peter didn't buy any potatoes.  
 B: \*That's not true! He did buy any potatoes. I saw it myself.
- (55.) A: Peter has not lifted a finger to help me.  
 B: That's not true! He did lift a finger to help you! I saw it myself.

Sedivy suggests that the reason why only "lexical" NPIs are acceptable in this context is that items like *any* have a non-NPI counterpart (*some* in the case of *any*) with the same meaning which can be used instead, while *lift a finger* does not have such an equivalent – therefore it must be used itself.

We are not sure that her reasoning applies for our case, but perhaps the availability of the compositional meaning (and the comparative transparency of the NPI meaning) do indeed play a role in the case of minimizers. We might speculate that some languages allow for "desperate imperatives" as an analogue to "rhetorical questions" – imperatives which are marked for speaker bias could be called "desperate". The imperatives in (54.) and (55.) are limited to contexts where the speaker increasingly fears that the order will not be obeyed. This bias is marked by both the minimizer as well as the modal particles. We will have to leave these observations for another day.

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