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**Polarity, Alternatives, and Scales**

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## 0. Introduction

The core theme of this dissertation is the question, how can we explain the behavior and the properties of (negative) polarity items within a stringent theory of natural language grammar? Negative polarity items are words, but also phrasal expressions, that cannot occur in simple episodic sentences such as “\**Yesterday I read any book*”, but they are almost always licensed in the scope of negation. Further examples are *ever*, or idioms such as “*budge an inch*”, but also expressions which put their focus on minimal quantities of the form “*even a single N*”. In analogy to these negative polar elements, there are also expressions which seemingly have a complementary distribution, like *already*, *also*, or the English determiner *some*, which appear to carry along an existential presupposition incompatible with negation directly scoping over such items.

The literature and theoretical history concerned with this topic has a longstanding tradition. It is important to notice, that (early) attempts to account for the relevant properties mostly refer to either of the three components of grammar: syntax, semantics or pragmatics. It has to be assumed, that none of the analyses are basically wrong, but rather that they display variable perspectives on the very same grammatical phenomenon. A principal motive for this work always was for me to find out, how we can come up with a comprehensive and explanatory analysis of the phenomena we observe, and how we can integrate these explanations into each of the parts of grammar. I think that there is even more hope now that we can achieve new and deeper insights on the question of interfaces or mutual isomorphy between these sub-components of grammar. This investigation, though more or less confined to phenomena of polarity, hopefully provides some contribution to this overall goal of linguistics.

There exist already very interesting and deep analyses, which also establish new relations between these components, especially in the realm of semantics of focus, scalar implicatures and general accounts on alternatives and alternative sets. With some exceptions from the nineties, this literature is rather recent, and the discussions about these topics seem to prevail.

This dissertation is structured as follows: In order to present the theoretical frame as well as the empirical domain in an adequate way, the first chapter is dedicated to a thoroughly commented presentation of the history of ideas to the selected topic. It will finish with a very detailed discussion of Krifka’s (1995) analysis of the semantic and pragmatic aspects of negative polarity items, which I take to express the core concepts, which are followed up until today by several authors, maybe under slightly different premises. Krifka’s proposal makes direct reference to alternative semantics, but there may be alternatives to that, which, however, differ only in subtle details and do not diverge from the overall claims.

The second chapter investigates the class of NPIs which is traditionally labeled as “weak”, a terminology going back to Zwarts’ typology of NPIs. Their licensing requirement is confined to the potential to draw inferences from (larger) sets onto (smaller) subsets. These contexts are also called downward monotonous, or downward entailing. We will see, that the scalar properties associated with such items (*any*, *ever*,...) are such that they demand such contexts in order not to be ruled out by stronger, more specific statements (e.g., polarity sensitive *any*), or in other cases that they precisely express the sole availability of such an unspecific formulation (free-choice *any*). A further focal point is the question, if we indeed have to assume two similar, but different though lexical expressions associated with two different meanings, or if it is not possible to derive the various uses (and differing interpretations) from a single basic meaning. The envisaged answer should be affirmative, and the core idea is that while *any* is to be treated as a quantificational expression, its meaning is devoid of any substantial content – in the course of diachronic development, its meaning was “bleached”. Perhaps it survived, or even became what it is now, because it can now be easily used to express emphasis on what some authors have called domain widening (cf. Kadmon & Landmann 1993). However, I take domain widening not as the direct contribution of *any* to a given proposition, be it potential or effective, but rather take the widest domain to be the actual meaning of the expression which is the complement of the quantifier *any* (a common noun phrase with number specification). More specific usages of (indefinite) noun phrases are due to a default mechanism commonly referred to as “existential closure”; or, in other cases, an inherited restriction of an operator binding the indefinite variable will have the same effect. Not so with *any*, which by itself represents a quantificational structure, ranging over situation/individual assignments, but rejecting any particular choice to be made upon them.

A special section is dedicated to the phenomenon that weak NPIs in contrast to strong ones are licensed in comparative constructions. While they invariably obey the diagnostics for ‘existential’/polarity sensitive uses, they in fact do get a universal like interpretation. This behavior is quite striking, but it directly follows from our assumption that the alleged universal flavor is an actual part of the meaning of these items.

In the third chapter I will round up the picture with a discussion of strong NPIs, which we will see consist of certain implicit or explicit particles associating with focus, thus introducing alternatives which are active in the discourse. Their alleged property, that they can only be licensed by anti-additive licensors, is slightly relaxed in the sense of Krifka (1995) in that the licensors themselves must be “extreme” with respect to their own scalar properties. This, as we will see, is due to the fact that focus generates alternatives that are active, so they have to be evaluated in all potential implicatures, and non-extreme/non-anti-additive downward entailing licensors (such as *few*) in fact give rise to existential implicatures.

A variety of other puzzling phenomena can receive a natural explanation in this overall framework, although I have to admit that not all ideas how to do so are mine. The treatment of NPIs involving focus goes back to Lee & Horn (1994) and Lahiri (1996), the treatment of the so-called sub-triggering effect in connection with other free-choice uses of *any* is due to Dayal (1998) and Chierchia's re-interpretation of scalar implicatures in a compositional framework represents a milestone in the history of analyses.

In the final section, I will propose some speculations how the picture we have gained may be integrated into a more elaborated theory how grammar works within its subsections. It seems to be clear then, that the referenced sub-components cannot be regarded as totally independent devices, that build upon each other in the way of opaque input-output relations. The interferences are too strong to maintain such a simplistic claim, however, one has to be careful what and to which extent to import certain notions and configurations in other domains.



## 1. Negative Polarity

Negative polarity items (NPIs) have attracted the interest of linguists over decades now. This may be due to the fact that a satisfactory explanation to their peculiar behavior was always a little beyond the limits, although many works on this topic have gained more and deeper insights. On the other hand the topic is hard to localize within the theory of grammar. Many components seem to play an important role, and NPIs can be regarded as a crucial test case to the formalization of the interfaces between the relevant components of grammar, in particular syntax, semantics and pragmatics. The term itself was introduced only some years after Klima's (1964) seminal work on negation.<sup>1</sup> His article about 'Negation in English' includes a great deal of the empirical description of NPI phenomena as well as an attempt to provide an abstract formalization. Labeling these objects as NPIs had the effect that these items were considered a coherent category of grammar, although it became evident soon that there must be at least several distinct types of NPIs.<sup>2</sup> In his introductory article about NPIs, which provides one of the most thorough and detailed overviews about the theoretical developments and problems so far, Ladusaw (1996) states very carefully: "[...] *a negative polarity item carries conventionalized requirements that limit its distribution to a proper subset of the grammatical contexts in which it would otherwise be expected to occur.*" [p. 325] In the following he explicitly reminds us that "*it seems clear that there is no uniform class of 'negative polarity items'. The range of licenses for some polarity items is larger than for others.*" [p. 326] This, however, may suggest that the types of NPIs themselves should be organized in a way that their licensing conditions can be organized within a subset relation, some of them being stronger than others, where strength can be defined in terms of logical entailment. Indeed, certain accounts based on Ladusaw's semantic characterization of NPI licensing (Zwarts 1990, 1995; Hoeksema 1986, 1994; Giannakidou 1997) assume this to be the case: while certain items are subject to weaker semantic conditions (non-veridical, downward-entailing), others are claimed to impose stricter conditions (anti-additive, anti-morphic).

The discrimination and sensible determination of the relevant types or classes of polarity items (PIs) is in fact one of the most important issues in the investigation concerned with this topic. In particular, it must be acknowledged that polarity licensing is

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<sup>1</sup> To my knowledge, the notions 'negative' and 'positive or affirmative polarity' were first introduced in C.L. Baker's (1971) paper on polarity reversal.

<sup>2</sup> This observation can be already found in Ladusaw (1979), but see especially Heim (1984) where she observes that *any* and complex items such as *so much as a single N* or *even a single N* do not always share the same licensing conditions in environments different from sentence negation, negative quantifiers or contexts where negation is expressed indirectly, such as adversative predicates.

not a uniform phenomenon. In Neubarth (1995) I have argued against the notion of negative polarity altogether as a valid term for the theory of grammar. This is too strong a claim, of course. One of the arguments raised there, that it would misguide our attempts to arrive at a more explanatory theory, is mainly polemic and may be challenged by the fact that the notion of ‘negative polarity’ proved as a quite useful cover term for a bundle of empirical phenomena, as well as of analyses dealing with NPIs. Under closer scrutiny, however, the notion itself reveals a problematic connotation: ‘polarity’ means some orientation (from a neutral center) towards two opposite directions along a certain shared unique dimension. In the realm of physics for example we know of electric charge having this property, in geography or geometry we find poles defined by the axis of the rotation of the earth. In linguistic theory we find the antagonism of truth values (true vs. false), but if we translate these terms into Boolean algebra (0 vs. 1), we instantly get the feeling that this is more about complementation than polarity in the primary sense. Regarding NPIs, all the items referred to as NPIs seem to be licensed within the (immediate) scope of sentence negation. But a closer look reveals a lack of coherency regarding the internal properties of those objects, and if other contexts are taken into consideration – and there are quite many of them – this impression of coherency vanishes immediately. So, the strategy will be first to establish a classification of these items (much of this work has already been done), but simultaneously one has to attempt to formulate explanations to the peculiar properties of each of these classes (in separation). One criticism, which applies to a variety of previous analyses to a certain extent, is that while these accounts are descriptively more or less adequate in defining the licensing conditions for certain items, they remain rather vague about a deeper explanation why these conditions should obtain. I hope that I can make a contribution to both, establishing a more profound classification of polarity items and providing some means towards explanatory adequacy.

Coming back to one of the points of interest stated in the beginning, in particular the assignment of the correct component of grammar responsible for polarity sensitive behavior, it is important to have a well-defined view right from the outset. In the 80-ies, there was quite some debate about this question, whether the conditions on polarity licensing should be formulated in syntactic or semantic terms, and also whether pragmatic factors play a role. This debate relates to the question, only rarely addressed: what actually goes wrong if an NPI occurs without appropriate licensing? Until today there are several schools of thought, although they are not so far from each other anymore. Unsurprisingly, these theoretical streams focus on certain types of PIs more than on others, according to the degree of match between the empirical data and the respective theoretical assumptions. None of the analyses can be claimed false in a principled way, but progress can be made only if the relevant insights are combined in an adequate way. Also, an analysis of NPIs and polarity phenomena in general along the lines proposed should shed some light on the

interfaces between the relevant components of grammar. The basic idea is to take the modular approach towards grammar seriously. One should not try to find the right level of grammar and establish the conditions on certain grammatical items or constellations just there, but rather one should take a holistic perspective and trace the relevant effects in each of these components. All correspondence between the relevant components can only be formulated in terms of interface conditions, so the information represented and handled within one of the components, or modules, will be substantially different. In turn this will permit to account for a greater range of phenomena within a single framework, but hopefully it will also lead us to some deeper insights on the organization of grammar and its sub-components.

### 1.1. A brief historical overview

The first work on negation and polarity items in the tradition of generative grammar was Klima's paper on negation in English. Given its large range of empirical data as well as the abstractness and accuracy of structural descriptions, it is an excellent starting point for our discussion.

#### 1.1.1. Klima (1964)

For the sake of simplicity, but also in order to highlight the connection to polarity phenomena, let us begin with a rather peculiar case, *any* in English, in its polarity sensitive variant. I will attribute *any* as well as *ever* to the class of 'weak', or 'exhaustive indefinite' NPIs.<sup>3</sup> The following list of examples illustrates the core cases of NPI licensing. The alleged licensors are underlined.

- |     |  |                              |
|-----|--|------------------------------|
| (1) | a. John hasn't <u>any</u> potatoes.                            | <i>clause-mate negation</i>  |
|     | b. *John has <u>any</u> potatoes.                              | <i>affirmative statement</i> |
|     | c. <u>No one</u> has any potatoes.                             | <i>negative quantifier</i>   |
|     | d. The mother of <u>none of the students</u> has any potatoes. | <i>embedded negation</i>     |

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<sup>3</sup> This term is derived from Krifka's (1995) analysis. It circumvents the terminological discussion, whether *any* is basically a universal quantifier with special properties, or an existential indefinite, which goes back to Horn (1972), but see especially also Carlson (1980). The latter discusses the advantages of the two possible analyses and concludes that *any* should be regarded as an existential. But the controversy never stopped and the reasons for a status as a universal are still valid. However, the debate is also a bit misled by the hidden assumption that *any* should be treated as a regular quantifier with its own force. See also Chierchia (2001), who treats *any* as an indefinite and induces quantification from the licensing side. For a detailed and very accurate overview on this discussion, see Horn (2000a). Just one further remark: I take exhaustiveness as the source of polar behaviour of *any*, which also pertains to the free-choice uses of *any*. Only in emphatic contexts, *any* (and perhaps also *ever*) lose their exhaustive interpretation in favour of a non-exhaustive, extreme, or scale-endpoint marking interpretation.

- |    |   |                                   |
|----|---|-----------------------------------|
| e. | I <u>don't</u> believe that John has any potatoes.  | <i>higher negation</i>            |
| f. | I <u>doubt</u> that John has any potatoes.          | <i>adversative predicate</i>      |
| g. | John <u>hardly</u> has any potatoes.                | <i>special negation/adverbial</i> |
| h. | Has John any potatoes?                              | <i>yes/no question</i>            |
| i. | <u>Only</u> John has any potatoes.                  | <i>"only"</i>                     |
| j. | John has <u>more</u> potatoes than anyone else.     | <i>comparatives</i>               |
| k. | John cooked Irish stew <u>without</u> any potatoes. | <i>"without"</i>                  |

The contrast between (1a) and (1b) is straightforward. NPIs are always licit in the scope of negation and they refuse to be grammatical (or interpretable) in simple declarative (episodic) statements. Klima (1964) accounts for this fact by assuming an abstract NEG category and certain transformational rules: Negation surfaces in a sentence by applying rules called 'neg-absorption', 'neg-placement', and 'neg-incorporation'. Another rule (*Indef-incorporation*)<sup>4</sup> renders an indeterminate (abstract, indefinite) quantifier (*Quant*)<sup>5</sup> as surface *any* (*Quant+Indef* in his terms) when it is "in construction with" an abstract grammatico-semantic feature labeled as "affective". The same quantifier (*Quant*) will turn out as *some* otherwise. (By a lexical insertion rule *Quant* will be rewritten as *some*). By this means he captures negation proper (NEG), but also negative quantifiers (1c, which have an incorporated NEG), even if they are embedded within an NP (1d), as well as higher negation (1e). On the other hand, adversative predicates (1f), and certain adverbials like *hardly* (1g), yes/no questions (1h), and arguments to *only* (1i), comparatives (1j) and *without* (1k) intuitively all share some characteristics with negation. Klima introduces this shared property as an abstract grammatico-semantic feature [GSF], which triggers *Indef-incorporation* and which he defines as *Affective*.<sup>6</sup> This feature is shared by all kinds of negation (except constituent negation), wh-operators (which in turn have to be regarded as abstract items), *only*, certain morphemes (i.e., negative affixes) and lexical items (i.e.,

<sup>4</sup> Klima uses the term '*Indefinite*' a bit misleadingly in order to refer to an abstract feature corresponding to the NPI properties of *any*.

<sup>5</sup> The idea that indefinites should be treated as regular quantifiers has been challenged since Heim (1982) who argued extensively that indefinites rather introduce a free variable to be bound by an appropriate operator. The difference is quite substantial, but it seems appropriate at this point to postpone the discussion to a later point.

<sup>6</sup> Cf. Klima (1964): [This] "*beg[s] for some formal expression within the grammar that does not necessitate the assumption of some total morpheme shared by them and occurring in their structure. What is needed here is some formal device [...] To incorporate these observations into the grammatical system, let us assume that morphemes can be further analyzed into bundles of grammatico-semantic features ( $[X]^{GSF}$ ).*" [p. 312] And more specific: "*As for the grammatical similarities of 'neg', 'wh-', and 'only', these will now be described as resulting from the presence of a common grammatico-semantic feature to be referred to as Affect(ive). Any Quant(ifier) in construction with a constituent that contains the feature Affect(ive) may ultimately appear as an indefinite.*"



adversative predicates). It has to be noted that although the formalisms changed a lot in the past 40 years (e.g., derivations and interface conditions instead of transformational rules) the basic idea and the syntactic implementation of grammatical processes is still accurate, even in contemporary terms.

### 1.1.2. Jackendoff's (1969) interpretative rule

One important question is: what are the exact defining properties of the stipulated feature “*Affective*” as a trigger for polarity licensing? A second question, which arises in connection with Klima's work, is about the status of the alleged rule, which triggers the lexical items *any* or *some* to show up in a certain configuration. Klima himself formulates carefully that there is just a correspondence between forms.<sup>7</sup> The discussion became essential with Jackendoff (1969), who takes his stand in the debate about the Lexicalist Hypothesis and who re-interprets Klima's transformations into rules for lexical items. His main argument is based on Chomsky's (1968/70) ‘Remarks on Nominalizations’, in which the assumption is challenged that every derivation can be represented as a set of transformations. Also, originating from Katz & Postal (1964) there has been the claim that transformations do not change the meaning of a sentence. Jackendoff shows that for the meaning of a sentence it is important to define the precise scope of negation. This cannot be done just by making certain rules (e.g., neg-placement) optional, provided that no transformational rule may alter the meaning. Two of the critical cases Jackendoff comes up with are interactions of negation with (weak) quantifiers in subject position and in passive constructions. Consider the following sentences,

- (2) a. Not many of the arrows hit the target  
 b. Many of the arrows didn't hit the target  
 c. It is not so that many of the arrows hit the target [Jackendoff 1969: 223]

Klima discerns between instances of constituent negation (e.g., 2a) and sentence negation. The latter could be paraphrased with a super-ordinated matrix sentence containing negation (2c). However, the sentence in (2b), which Jackendoff identifies to be an instance of VP-negation, cannot be paraphrased as either of the alternatives, since its meaning differs from both, negation having scope over the whole sentence and constituent negation. In modern terminology this means that the weak quantifier in subject position cannot reconstruct to a

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<sup>7</sup> “I am not speaking of correspondence in syntactic derivation; that is, I do not mean that sentences with *any* and its combined forms are derived specifically from sentences with *some*. Examples like ‘This house doesn't have any roof’ indicates that this is not the case. Rather, *some* is one of the several underlying forms from which *any* is derived syntactically.” [Klima 1964: 282]

position lower than negation, hence the subject position is excluded from the scope of sentence negation.

Next, consider passive sentences. Passive would be a case where the scope of negation is fixed (at the VP-boundary), but constituents are shuffled around. Obviously, the scope of negation after the passive transformation determines the meaning of the sentence.

(3) The target wasn't hit by many arrows.

A constituent containing a scope sensitive quantifier like *many* has a different meaning (with respect to negation) according to whether it occurs in object or (derived by the passive transformation) subject position. This leads to the conclusion that Klima's notion of sentence-negation is too strong and that the scope of negation has to be identified by the constituent it is 'in construction with' after certain transformations have applied.

Now consider the pairs of items that would take part in a rule defining which of the two is the appropriate form (maybe as a filter on transformations, or lexical insertion). *Some/any* is the most prominent one in this context, *once/ever*, *too/either* should be treated alike, but there are also contexts where only one of them exists: *any more*, *at all*. Klima is aware of the fact that certain constructions (inalienable possession for instance) would not permit the *some* variant, but are fine with *any* in an affective environment. (See footnote 7.) But still he treats *some* as the more basic (less complex) item than *any*. The question comes to mind what if *some* should also be treated as a derived form?<sup>8</sup> Jackendoff initiates the criticism against such a rule operating directly or indirectly on lexical items and proposes a reformulation in terms of a rule of semantic interpretation.

(4) *"If an indeterminate is unspecified with respect to X, the rule fills in the feature according to the environment. If the indeterminate is already marked with respect to X, the sentence is marked semantically anomalous if the inherent feature and the feature assigned by the rule disagree."* [Jackendoff 1969: 232]

Although Jackendoff still pertains in some sense to the *some-any* rule, there is a fundamental difference between Klima's transformational account and the interpretive view. Citing Jackendoff, *"The difference is in the first part of the convention on application (4) [orig. 59]. The claim is that the some-any rule fills in a feature of semantic relevance, and thus contributes to the reading of a sentence in which the feature X has been left unspecified on a noun phrase. A filtering transformation could only use the second part of the convention, blocking incorrect constructions but never contributing to*

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<sup>8</sup> Cf. Szabolczi (2002), although I do not share her premise that *some* is equipped with a double *npi*-feature. See also Krifka (1995) who explicitly rejects and argues against the idea that *some* is a polarity item.

*the reading*” [Jackendoff 1969: 233]. That certain items contribute to the meaning by themselves is an immensely important observation. The formulation “*semantic anomaly*” points in a direction that has been taken up later on by Ladusaw, but only in the last ten years it has become obvious that an explanation for the specific properties of *any* has to be sought in the meaning properties of that item. The only source of confusion, which is left here, is the impression that it is one particular feature that would discern items like *some* or *any*. (While Klima uses ‘*Indef*’, Jackendoff talks about ‘*specificity*’.) My claim is that, regardless of the abstract make-up of the items in question (e.g., as indefinites with some quantificational flavor; *no* is also part of the paradigm), each of these items has its own particular and independent semantic properties. The illusion that one item could be derived from the other stems from two coincidences: first the fact that in semantics we are using the same primitives (negation, indefinite, specificity, quantifier, affective) as in syntax and morphology, and second, morpho-syntactically these items stand in a paradigmatic relation to each other. However, as for now, the set of primitives we use is still too coarse to characterize the semantic contribution of these items to the meaning of a sentence. (Notice that the assumption that they provide their own contribution to the meaning of a sentence is not uncontroversial.) And further, even if the sources of grammaticalization are comparable, the lexical items themselves lead their own life. Merging them together into a simple and uniform paradigm helps us to formalize the basic facts, but hinders us to understand the more intricate phenomena associated with these items.

### 1.1.3. C.L. Baker’s (1971) polarity

Already C.L. Baker (1971b) has given good reasons to abandon a rule, which defines lexical items such as *any* and *some* as complementary items. At first glance, the idea seems attractive, though. Certain items (most prominently *some*) seem to display the opposite behavior to negative polarity items (in fact the terminology stems from this paper) in that they refuse to be in the scope of negation. These items are labeled ‘positive’ or ‘affirmative’ polarity items, whereas other items apparently behave just like *any*:

#### *Temporal adverbs:*

- |     |    |  |     |
|-----|----|--|-----|
| (5) | a. | The Sox {have/*haven’t} <i>already</i> clinched the pennant. | PPI |
|     | b. | John <i>still</i> plays golf.                                | PPI |
|     | c. | *John doesn’t <i>still</i> play golf.                        |     |
|     | d. | John <i>still</i> doesn’t play golf.                         |     |

*Degree adverbs:*

- (6) a. He {did/\*didn't do} *pretty* well on the exam. PPI  
 b. He {is/\*isn't} *far* taller than his uncle. PPI  
 c. The colonel {\*is/isn't} *all that* bright. NPI

*'Attitude predicates':*

- (7) a. I {would/\*wouldn't} *rather* go to New Orleans.<sup>9</sup> PPI  
 b. Jacques {could/\*couldn't} *just as well* have taken the train. PPI  
 c. Bob probably {won't/\*will} *bother* leaving a number. NPI  
 d. I don't *care to go* / \*I *care to go*. NPI

*Idioms:*

- (8) George {\*has/hasn't} *lifted a finger* lately. NPI

Double negation is the easiest case to demonstrate the dilemma: both kinds of polarity items can occur under double negation.

- (9) a. There isn't *anyone* in this camp who *wouldn't rather* be in Montpellier.  
 b. You can't convince me that *someone* isn't *still* holed up in this cave.

In (9a) the PPI expression *would...rather* is in the scope of both negations, (9b) shows that *some* may have wide scope even over a negation in a higher clause or at least it is insensitive to it and that *still* is fine under double negation. One problem addressed by Baker is that if we assume that double negation is canceling out (two times polarity reversing), one has to account for the fact that polarity reversal is an optional process.

- (10) a. There isn't *anyone* who doesn't care to do *anything* down town.  
 b. There isn't *anyone* who *wouldn't rather* do *something/\*anything* down town.

Crucially, if polarity reversal applies, the status with respect to PIs holds for the whole scope domain. In order to avoid unmotivated optionality, Baker disfavors the simplistic polarity reversal account and proposes some kind of indirect licensing. Briefly it says that if an expression Y is in an appropriate context P' (concerning polarity), where P' is entailed by P, the original context, and both, P and P' are well-formed semantic representations, then the lexical representation appropriate to Y in P' is also appropriate to Y in P. A structure with two negations entails a sentence with no negation. A structure with a negated existential plus a negation entails a universal statement with no negation by virtue

<sup>9</sup> Note that the scope of negation is crucial here. A sentence like 'I would rather not go to New Orleans' is perfect, but it is not the negation of (7). The same holds for some temporal adverbs, cf. (5c).

of Morgan's Law. Baker's proposal tries to account for the fact that polarity licensing involves some sort of locality. Once a NPI is licensed by some operator, be it negation or some other element capable of licensing, it remains so even if higher operators would reverse polarity. This has always been a worrying fact, and has led to specific solutions. Krifka (1995) proposes a dynamic strategy of assertions, Chierchia (2001) builds in locality for NPI licensing as universal closure by an operator ranging over widening functions. He also invokes the metaphor of syntactic feature checking, a strategy I take for unwarranted in the context of NPIs. Baker's early paper basically deals with multiple negations. Even more worrying are sentences where NPIs are licensed by a wh-operator. Consider yes/no questions:

(11) Has *anyone already* found *some* solution to this problem?

Here, the simplistic polarity reversal completely breaks down. Returning to the beginning of our discussion, the benefits of Klima's original account are obvious. Negation is treated as an abstract category, only indirectly linked to items or morphemes via post-transformational lexical insertion. In the easiest case, negation is expressed by a *neg*-morpheme on the surface.<sup>10</sup> Polarity licensing (in modern terminology) is pursued by an abstract feature (*Affective*) and not on surface structure. The notion "in construction with" can easily be translated into a more contemporary version of "c-command" (syntactically) or "be in the scope of" (semantically). Essentially this means that polarity licensing is a semantic phenomenon with a strong syntactic correlate.

#### 1.1.4. R. Lakoff (1969): against a *some-any* rule

Robin Lakoff (1969) – five years after Klima – presents some data, which challenge the purely semantico-syntactic perspective. In cases where both items (*any* and *some*) are appropriate, such as questions or conditionals, underlying presuppositions also play a crucial role. Antecedents of conditionals as well as the restriction (but not the nuclear scope) of universal quantifiers count as NPI licensing environments:

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<sup>10</sup> This is especially important with negative determiners. It can be shown that under certain circumstances, the scope properties of negation and the indefinite associated with the determiner differ. For instance under modals, negation has scope over the modal predicate, whereas the indefinite must be interpreted as being within the scope of the modal. (Cf. Penka 2002, von Stechow & Penka 2002.) E.g., '*He can see no blood*'. Also a correct analysis of Romance n-words and negative concord crucially depends on the assumption that negation is treated as an abstract operator, rather than a morpho-syntactic item with a negative feature.

- (12) a. If John has any potatoes he should cook them. *antecedent of conditional*  
 b. Everyone who has any potatoes should cook them. *restriction of universal*  
 c. \*Everyone who has a big pot should cook any potatoes. *nuclear scope*

These environments permit both types of indefinite quantifiers; however, their meaning still differs. Truth-conditionally they appear to be equivalent, but with respect to appropriate contexts, the two variants of the following sentences convey different attitudes by the speaker.

- (13) a. If you eat {some/any} spinach, I'll {give you ten dollars/whip you}.  
 b. Do you think those men want to do {some/any} work?  
 c. Who wants {some/any} beans? [R. Lakoff 1969: 609f]

The *some*-variants carry along a positive presupposition whereas the variants with *any* are either neuter or negative. Therefore, the secondary variants in (13a) do not freely match, the first one expresses some hope or desire, whereas the latter a kind of threat (under normal circumstances). A positive presupposition clearly is not compatible with a threat, which by itself conveys some negative presupposition; hence *some* is not felicitous with the threat to be whipped. Consequently, the same holds for questions. (13b) with *some* will only be appropriate if the speaker assumes that the workers actually would want to do some work and the sentence could be followed by something like '*because my road needs to be repaired*'. In (13c) the speaker assumes that someone would take the offer of beans. On the other hand, the same sentences with *any* can under no circumstances be used to express such a positive presupposition. On the contrary, they may have a negative one behind, such as in (13c) one could follow up with a statement like '*because they've been standing around all morning telling dirty jokes*'. Or the sentence has no presupposition at all, just being neuter with respect to the speaker's assumptions or expectations. This latter option is very important, since it imposes a severe problem to those analyses, which employ negative implicatures for NPI licensing in general (Linebarger 1980, 1987). The insight brought up by R. Baker is that it is not sufficient to look only at the semantics of a sentence to decide whether *any* or *some* would be the proper lexical items inserted into the structure. Also some pragmatic factors (which she attributes to presuppositions) play a fundamental role.

#### 1.1.5. Fauconnier's pragmatic scales

Fauconnier (1975a,b) gives further evidence for this claim, but he also provides us with new tools for a better understanding. First it is very important to clarify which role pragmatics exactly plays in licensing NPIs, since pragmatics should definitely be considered as an extra-grammatical level with independent conditions, which must not be

considered as operating on grammatical entities. Let us assume that logical structures may be ambiguous in certain respects. Therefore they allow for more than one type of pragmatic context in a similar way as (surface) syntactic structures allow for more than one logical interpretation. Implicatures play the crucial role, and their effect can be stated in terms of evaluating a specific context that is already associated with a given sentence. The need for evoking implicature in the context of polarity phenomena stems from the fact that the relevant properties of sentences cannot be directly read off from the logical structure alone.

The key notion Fauconnier introduces is ‘pragmatic scales’. The basic observation is that grammatical superlatives sometimes give rise to an interpretation that is very similar to universal quantification:

(14) Tommy will not eat the most delicious food.

The object in (14) can be read as a definite DP. Then the sentence has the meaning that Tommy would maybe eat all kinds of food except for the most delicious. The more natural interpretation, however, is that Tommy refuses to eat any food at all. This phenomenon of implied quantification is not restricted to grammatical superlatives. Several noun phrases give rise to the same quantificational force crucially depending on pragmatic factors:

- (15) a. Iago would betray his own brother      (= He would betray anybody)  
 b. Onassis couldn't afford this place      (= Nobody could afford it)

Other examples where superlatives give rise to quantificational interpretation show that the possibility of assigning this semantic value (quasi-universal quantification) depends on the environment where the superlative occurs:

- (16) a. Alex can't solve the simplest problem.  
           (= Alex can't solve any problem)  
 b. Alex can solve the simplest problem.  
           (≠ Alex can solve any problem)  
 c. #Alex doesn't mind solving the simplest problem.  
           (≠ Alex doesn't mind solving any problem)

The contrast between difference between (16a) and the (b) example shows that the availability of the relevant universal reading depends on the polarity status of a sentence. Reversing polarity inhibits this reading, which may lead to a contextual anomaly, as (16c) shows. In order to capture this insight, Fauconnier formulates a principle, which he calls the ‘Weak Polarity Principle’ (WPP): “*whenever a quantifying superlative is appropriate in an affirmative (respectively negative) sentence, it is inappropriate in the corresponding*

*negative (respectively affirmative) sentence.*” [Fauconnier 1975b: 189] This WPP also carries over to contextually polarized phrases:

- (17) a. Even the Pope is tempted to use contraceptives.
- b. #Even the Pope is not tempted to use contraceptives.

Such sentences are appropriate only in contexts compatible with the presupposition of the phrase modified by *even*. (It has to be assumed that the Pope is one of the least likely persons to be tempted to use contraceptives.) However, reversing the polarity of the sentence does not yield ungrammaticality as perceived with standard polarity items; neither does it result in the loss of a semantic reading as with superlatives, the sentence rather becomes ill formed just with respect to its pragmatic context. Maybe it is worthwhile to note that it suffices to embed the sentences with the non-universal reading or ill-formed pragmatics under a polarity-reversing context in order to regain the universal interpretation.

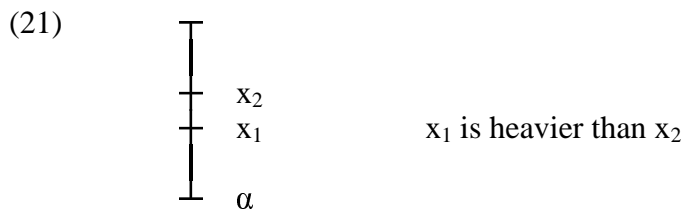
- (18) a. I'm surprised that he can solve the simplest problem.
- b. You can't convince me that even the Pope is not tempted to use contraceptives.

What can we gain from the WPP? Stated the way it is it would just be an extension of the polarity reversal account – as described in Baker (1970b,c) – onto pragmatically sensitive constructions. But Fauconnier proposes a fascinatingly simple concept as an explanation, based on the assumption of pragmatic scales. Consider the following sentence:

- (19) Alexej can lift weight  $x_1$

If we assume that there is a weight  $x_2$  lighter than  $x_1$  we may conclude that Alexej can lift also  $x_2$ . This is not a strict logical entailment, since it could be possible that weight  $x_2$  is harder to handle and therefore beyond the facilities of Alexej, it is a pragmatically motivated implication. But now we can establish a whole scale of weights, associated with the ‘propositional schema’ in (20):

- (20) Alexej can lift  $x$



If we define  $\alpha$  as the lowest point on that scale, then a sentence ‘Alexej can lift  $\alpha$ ’ will implicate that Alexej can lift any other weight  $x$  on the given scale. Grammatically,



endpoints of scales are typically expressed by superlatives. In this example it would be ‘the heaviest weight’. Fauconnier suggest to formulate this pairing between pragmatic scales (S) and the logical structure of a propositional schema (R) in the following way:

(22) Scale Principle: If  $x_1$  is lower than  $x_2$  on a scale S, then  $R(x_1)$  implicates  $R(x_2)$ .

Corollary: If R holds for the lowest element  $\alpha$  on S, it holds (by implicature) for all elements on S. ( $R(\alpha)$  implicates  $\forall x R(x)$ ). [Fauconnier 1975b: 193]

Now the WPP can be accounted for: If a scale S with a low point  $\alpha$  and a high point  $\beta$  is associated with  $R(x)$ , then for  $x_1$  lower than  $x_2$  the following implication holds  $R(x_1) \Rightarrow R(x_2)$ . The reverse direction must obtain when the schema is negated (by entailment):  $\neg R(x_2) \Rightarrow \neg R(x_1)$ . The whole scale will be reversed under  $\neg R$ . Hence  $\beta$  will be the low point rather than  $\alpha$ , and if  $\alpha$  triggers the quantificational implicature in schema R, it will no longer do so under  $\neg R$ . Polarity reversal properties should be represented in the same fashion. If one assumes that more than one propositional scheme may be associated with the same scale then one can easily represent domain extension within this frame. Suppose that a scale S is associated by definition with the scheme  $R(x)$  and with another scheme  $Q(x)$ , where  $Q(x)$  is complex in that it contains  $R(x)$ :

(23)  $Q(x) = \text{“You can’t convince me that } \neg R(x)\text{”}$

By the scale principle and given the characteristics of *convince* and negation,  $Q(x_1)$  implicates  $Q(x_2)$ , and  $Q(\alpha)$  implicates  $\forall x Q(x)$ . This does not give a straightforward explanation for polarity reversal in general, but it exemplifies how the model can be extended compositionally. More than 25 years later Chierchia (2001) proposes a model where scalar implicatures are computed strictly compositionally. The basic idea can be found in Fauconnier’s association of scales generated by implicature and semantic formulas. Also, polarity is not understood as a genuine grammatical phenomenon but rather embedded into a wider range of phenomena. Fauconnier directly addresses the connection between pragmatic scales and idiomatic expressions behaving like standard polarity items. The only peculiarity of items like *lift a finger*, *bat an eye*, *be worth beans*, etc. is that in their idiomatic meaning they refer to low endpoints of scales. See section 1.3 for a more detailed explanation for their behavior. Note that plain indefinite noun phrases can sometimes be interpreted similar to polarity items like *any* (Schmerling 1971).

- (24) a. I didn’t hear a sound.  
 b. He didn’t say a word.  
 c. He didn’t move a muscle.

These noun phrases are also interpreted as low points of scales corresponding to schemata like ‘I didn’t hear x’. Another point in favor of Fauconnier’s analysis is that universal quantifiers do not license NPIs although they are logically equivalent to sentences with double negation.

- (25) a. \*Everyone lifted a finger.  
 b. There wasn’t anyone who didn’t lift a finger.

The scale principle does not invoke relatedness of sentences. The schema in (25a) is not associated with a scale where *lift a finger* is a low point. However, (25b) is grammatical since “*the Scale Principle can apply to subconfigurations*”. [Fauconnier 1975b: 197] Nevertheless, certain problems remain open, still. One of them is what determines whether the Scale Principle applies to a subformula or to a complex ‘propositional scheme’. This relates to the observation that licensing of polarity items obeys the Coordinate Structure Constraint and the Complex Noun Phrase Constraint formulated in Ross (1967).

- (26) a. Mrs. Crabtree refuses to let her daughter elope with anyone  
 b. \*Mrs. Crabtree refuses to let her daughter and anyone elope
- (27) a. I didn’t see anyone’s husband at the meeting  
 b. \*I didn’t see the man anyone is married to at the meeting

Several authors suggested that these constraints should operate beyond syntax as well (Fauconnier 1975a,b; Baker 1970b, Linebarger 1980, 1987), whereas others tried to assimilate polarity phenomena to movement constraints, i.e. to render polarity licensing a syntactic phenomenon (Progovac 1988/94, Guerzoni 2001). Such claims definitely need clarification. I think that it is not really necessary to extend the role of grammatical levels beyond their domain. For example Chierchia (2001) shows that the Immediate Scope constraint formulated by Linebarger (1980, 1987) can be integrated into his theory about the computation of scalar implicatures. The same reasoning applies to the effect the Coordinate Structure Constraint has in connection with polarity items. If we follow Chierchia, then scalar implicatures are computed the same way as meaning is processed compositionally. The role of syntax is confined to its contribution to how meaning is processed. What is needed is a semantic theory that is rich enough to include discourse linked properties and precise enough to provide an exhaustive matrix of entities, be it features or salient items with certain properties, that can be mirrored in the functional domain of syntactic structures. If this is possible, it will fall out naturally that polarity obeys syntactic island constraints, because then polarity is a phenomenon that is syntactic as well since it has its roots in the logical and discourse related parts of grammar.

Another problem addressed by Fauconnier is negation (or assertion) of existence presupposed with some sentences. Consider the following examples:

- (28) a. He didn't hear any noise.  
 b. He didn't hear the faintest noise.  
 c. He didn't hear (even) the loudest noise.

(28c) works according to the Scale Principle. The low point of the scale associated with the scheme '*not hear x*' is the loudest. On the other hand (28a,b) have a reading where they are logically equivalent and both of them presuppose that there wasn't any noise to be heard. However, the Scale Principle seems to be violated. The sentence in (28b) should not permit a quantified reading. Note that not all kinds of grammatical superlatives and not all predicates permit this sort of interpretation:

- (29) a. He didn't eat any food.  
 b. #He didn't eat the most awful food.
- (30) a. Nelson did not pay attention to any emotion in Richard's face.  
 b. #Nelson did not pay attention to the slightest emotion in Richard's face.

The (b) examples do not permit a quantified reading. Although *the slightest* is in the same class of adjectives as *the faintest*, it is impossible to get the 'negation of existence' reading because the predicate *pay attention to* presupposes the existence of its object. (Note that the reading becomes possible when we use the almost synonymous predicate *notice*, which does not presuppose existence.) What these sentences show is that only superlatives sharing some feature 'minimum quantity' allow for quantified readings. A sentence like (28b) vaguely implies that there was no noise at all to hear, thus the interpretation of the superlative could be described as 'zero quantity'. In other words there is a conversational implication of an existential statement like the following:

- (31) There wasn't the faintest noise.

In this sentence the Scale Principle can apply felicitously. Though it is not associated with a propositional scheme corresponding to the predicate of (28b), it corresponds to a scheme expressing existence. Minimum quantity is the low point of such an 'existence scale'.

- (32) There isn't a/any drop of wine in the bottle.

The quantifier *any* in this framework is analyzed as the low point of a scale, too. However, it is ambiguous between a scale that is associated with the predicate of the sentence, which results in a quasi-universal reading, or a scale, which is associated with existence of a referent denoted by the NP.

### 1.1.6. Ladusaw: downward entailing operators

Based on the insights presented above Ladusaw (1979, 1983) went a step further and correlates the scales and their sensitivity to polarity reversal to a semantic property of a wider range of operators. He discovered that NPIs are generally grammatical in the scope of downward entailing (DE) operators. That this is not simply a semantic reformulation of Klima's notion 'affective' can be seen in the following examples, where the NPI *ever* is licensed in the restriction of a universal or negative quantifier, but only in the nuclear scope of a negative quantifier. Klima's characterization, as it stands, is not apt to capture such a restriction of a universal.

- (33) a. {No student / every student / \*some student} who had ever read anything about phrenology attended the lecture.
- b. {No student / \*every student / \*some student} who attended the lectures had ever read anything about phrenology.

Ladusaw proposes a formulation to account for NPIs in general. It will become clear later on that: a) the intuition that downward entailing functions play a crucial role in the licensing properties of certain NPIs is correct, but b) DE-ness is not the only determining factor, and c) many of the alleged problems with Ladusaw's original insight have to do with the failure of recognizing different types of NPIs.

- (34) a. A negative-polarity item is acceptable only if it is interpreted in the scope of a downward-entailing expression.
- b. An expression  $\delta$  is downward-entailing (affective) iff its denotation  $\delta'$  is a monotone decreasing function.  $\delta'$  is monotone decreasing iff
- $$\forall X \forall Y \circ [[X \subseteq Y] \rightarrow [\delta'(Y) \{\subseteq/\rightarrow\} \delta'(X)]]$$
- c. For any two expressions  $\alpha$  and  $\beta$ , constituents of a sentence  $\phi$ ,  $\alpha$  is in the scope of  $\beta$  with respect to an interpretation of  $\phi$ ,  $\phi'$  iff the interpretation of  $\alpha$  is used in the formulation of the argument to  $\beta$ 's interpretation of  $\phi'$ .

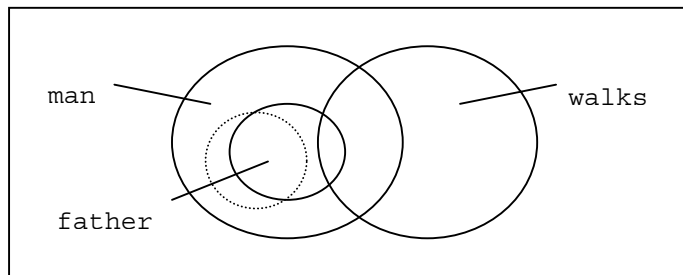
[Ladusaw 1980: 12f]

If we look at functions from a set-theoretic perspective, exactly those operators are downward-entailing, whose truth conditions remain stable even if we make the denotation set of a given function smaller, by imposing an implicit or explicit additional restriction onto it. For example, the denotation of a noun '*man*' is a superset to the denotation of the noun '*father*' or if we take a predicate like '*walk*', its denotation can be reduced by adding the adverb *slowly*. Compare the following examples:

- (35) a. no man walks  $\rightarrow$  no father walks (DE)  
 b. every man walks  $\rightarrow$  every father walks (DE)  
 c. some father walks  $\rightarrow$  some man walks (UE)
- (36) a. no man walks  $\rightarrow$  no man walks (DE)  
 b. every man walks slowly  $\rightarrow$  every man walks (UE)  
 c. some man walks slowly  $\rightarrow$  some man walks (UE)

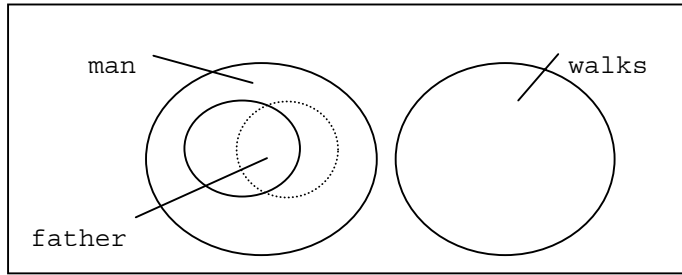
The semantics of a negative quantifier is that the intersection of the denotation of its two arguments must be empty, whereas the opposite is true for the indefinite *some*. For universals it must hold that the denotation of the first argument is a subset of the denotation of the second. Restraining, or better restricting the denotation of one argument (function) is fine with respect to the truth value if the intersection must be empty anyway or if it is in a subset-relation to the other, or if the intersection is upward bounded (*at (the) most n NP, few*), but not otherwise. The following graphic representations may illustrate this:

- (37) *some*:  $\lambda X \lambda Y \exists x: [X(x) \wedge Y(x)]$



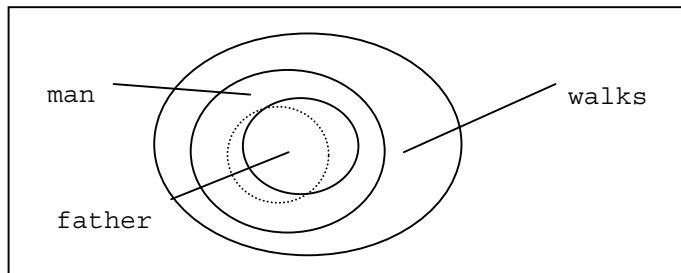
If we start out with ‘*some father walks*’, the sentence is true if the intersection between *father* and *walks* is not empty, which is the case if we consider the solid lines. Substituting *man* for *father* does not affect the truth-value because *man* is a superset of *father*. This is the upward entailing property of a quantifier like *some*. The same can be shown to hold for the second argument. If *some* were downward entailing instead, it should be possible to substitute *father* for *man*. However, as can be seen with the dotted circle, it may well be that the intersection of the two relevant functions is empty. The quantifier *no* has the reverse meaning, the intersection must be empty.

(38) *no*:  $\lambda X \lambda Y \neg \exists x: [X(x) \wedge Y(x)]$



On both functions ( $X$  [ $x$  is a man] or  $Y$  [ $x$  walks]), we may arbitrarily reduce the sets (e.g., changing *man* to *father*, or *walk* to *walk fast*); the intersection will remain empty. Now consider the meaning of the universal quantifier *every*. It can be described as a conditional, for every instance of the variable  $x$ , if the first function of  $x$  is true, then the second must be true as well.

(39) *every*:  $\lambda X \lambda Y \forall x: [X(x) \rightarrow Y(x)]$



Substituting any arbitrary subset for *man*, i.e., *father*, does not change the truth of the sentence, since it will always be a subset of the denotation of *walks*. The reverse situation is true for the second argument; it may only be substituted by a superset. Hence *every* is downward entailing on its first argument and upward entailing on its second. It has to be mentioned that not all quantifiers are upward or downward entailing, *exactly n* is an example for a quantifier which is neither.

Ladusaw provides a logical definition for the entailing properties of certain operators, and importantly, the definition does not refer to negation as the trigger for polarity reversal, but rather rests on inherent set-theoretic motivated considerations. Combined with the scales-analysis developed by Fauconnier it gives us a rather powerful account for NPI licensing. Remember that the scales are defined as pragmatic inferences where the truth of the formula associated with the relevant endpoint of the scale implicates the truth of all other members on the scale. Several problems have to be resolved still; I will address some of them in the following sections. One of them is the dual nature of scales between universal quantification and existence, another is that not all NPIs are minimizers in the relevant sense. Before going into more detail, I will discuss an influential analysis, which imposes severe criticisms against a semantic analysis along the lines suggested above.

1.1.7. *Linebarger (1980, 1987): negative implicatures*

Linebarger (1980, 1987) argues for a conditioning of NPI licensing on the syntactic level of LF plus an indirect licensing which makes use of pragmatic implicatures. Her claims against Ladusaw's analysis go into two directions: one is that the DE approach is empirically not correct. Another criticism is that semantics in itself should not be considered as a level of grammar independent from syntax. The configurations relevant for semantic interpretation are represented at LF, which is the interface between syntax and the computation of meaning. In my view, this criticism does not hold in its strict formulation, since nothing prevents us to conceive Ladusaw's notion 'in the scope of a DE-operator' as an LF requirement.<sup>11</sup> Linebarger proposes a licensing mechanism in two layers. Core licensing is done solely by negation. However, there is an important additional requirement, a NPI must be in the immediate scope of negation. This means that no other operator must intervene between negation and the NPI to be licensed.

The Immediate Scope Constraint (ISC) goes back to the observation made by Lasnik (1975) that certain quantifiers and operators are ambiguous with respect to the scope of negation (as already noticed by Jackendoff 1969). Consider the following sentences: in (40a,b) the syntactic configuration determines the scope relations between *often* and negation, but (40c) is structurally ambiguous. Interestingly, the different meanings are discerned prosodically, when the quantifier *often* is outside the scope of negation, then there is an intonation break, indicating that *often* is not in the same intonation phrase.

- (40) a. Often, I don't attend class. (wide scope)  
 b. I don't often attend class. (narrow scope)  
 c. I don't attend class(,) <sup>12</sup> often. (ambiguous) [Lasnik 1975: 286]

Now, the same reasoning applies to causal adjuncts and purpose clauses, also prosodically specified for scope relations but structurally ambiguous, although contextually one of the readings may be disfavored:

- (41) George doesn't starve his cat(,) because he loves her. [Linebarger 1987: 333]  
 (42) Senator Eastland doesn't grow cotton(,) to make money. [Lasnik 1975: 283]

Unsurprisingly, the same ambiguity arises with negative quantifiers in subject position.

- (43) Nobody eats mousse because it's health food. [Linebarger 1987: 333]

<sup>11</sup> This option is also acknowledged in Linebarger 1987.

<sup>12</sup> The comma indicates an (optional) intonational break.

However, the ambiguity disappears, if a NPI is present in either of the clauses, and the sentence will be ungrammatical if a NPI shows up in both sentences. (Under the relevant, grammatically possible interpretation, however, these sentences are clearly pragmatically odd.)

- (44) a. He didn't *budge an inch* because he was pushed.  
 b. George doesn't starve his cat because he has *any* love for her.  
 c. \*He didn't *budge an inch* because *anyone* pushed him.

It can also be shown that universal quantifiers interact with negation in a way that the ISC applies. Unless one can construe a wide scope reading of the universal, the following sentence also yields ungrammaticality:

- (45) a. John didn't give a red cent to every charity.  
 b. \*NOT  $\forall x$  (x a charity), (John gave-a-red-cent to x)  
 c. ?  $\forall x$  (x a charity), NOT (John gave-a-red-cent to x)

But not all environments where NPIs show up licitly involve explicit negation. Linebarger refers back to Baker's (1970b,c) account for polarity licensing, which similarly assumes either licensing by overt negation or by entailment of a proposition which contains negation. Contrary to this proposal, Linebarger argues for an indirect licensing by implicature. Entailment, she claims, is both too weak and too strong in order to explain the facts. The first problem was already noticed in Baker (1970c): for every affirmative sentence, there is a logical equivalent with double negation, where an NPI would be licensed. But it is also too strong: consider a sentence where negation has scope over the causal adjunct, hence an NPI is licensed there.

- (46) a. I didn't help him because I have any sympathy with urban guerrillas  
 b. NOT CAUSE ( $\exists x$  (I have x)), I helped him) [Linebarger 1987:342]

Direct licensing cannot obtain, since the CAUSE operator shields negation from the NPI. When the causal relation is negated, the whole proposition does not entail the truth of the causal adjunct. (46) asserts that '*I helped him, regardless whether I have any sympathy with urban gorillas*'. Linebarger notices that (46a) can impossibly be followed by a sentence which stresses the truth of the causal adjunct, something like '*although I DO sympathize with urban guerillas*'. From this fact she draws the conclusion that it is in fact negative implicatures, which are responsible for indirect licensing. A NPI is licensed if there exists an implicature where the NPI is in the immediate scope of negation (core licensing.), with the proviso that the negative implicatum (NI) strengthens the proposition P. "*The truth of NI, in the context of the utterance, virtually guarantees the truth of P.*" [Linebarger 1987: 346]. This is necessary in order to exclude certain potential



NIs, which do not contribute to NPI licensing, such as the ineffective entailments of doubly negated sentences.

While it is possible to explain a much wider array of data with this approach, the role of pragmatics at this point still remains slightly mysterious. Another shortcoming (which applies to many analyses, though) is that it is impossible to discern different licensing mechanisms for different types of polarity items. On the other hand it is worth noting that Linebarger's proposal had great influence on accounts which investigate and emphasize the syntactic side of NPIs (cf. Laka 1990, Progovac 1994, and lately – although under a different perspective – Guerzoni 2003) and the connection with negation (cf. Zanuttini 1991, Haegeman 1995). Remember that her account for NPI licensing is based on 'core licensing', which is defined in terms of (immediate) scope of negation proper over the NPI at the syntactic level of LF. While it seems appealing at first sight to establish a syntactic mechanism for a phenomenon like NPIs, it leads us onto a very dangerous trail: syntax *per se* is rather blind towards semantic or pragmatic intricacies. In the newer versions of the minimalist framework (Chomsky 1995, 1999/2001) syntactic operations are confined to the satisfaction of interface conditions, i.e. feature checking in order to remove uninterpretable features, which would otherwise render the derivation illicit at one of the interfaces. If we wanted to maintain our aim to find a syntactic account for NPI licensing, this would force us to introduce certain features responsible for the respective behavior (see Postal 2000, Szabolczi 2002a for quite recent treatments, which extensively use a polarity feature). However, this would bring us back to the start, since any realistic implementation would not be able to add anything beyond Klima's analysis from 1964, and nothing will ever remedy the problems brought up thereafter. Also, Linebarger's proposal doesn't halt at a pure LF-based account, but has to introduce an indirect licensing by negative implicatures which strengthen the assertion. Now, as far as scope relations between certain operative elements and NPIs are concerned, we surely also have to discuss the properties of the relevant syntactic structures. But this does not exempt us from the obligation to find a real explanation for the fact that certain NPIs must be in a certain relation with certain operators. The next section will focus on the exaggerated use of the word 'certain' in the last sentence and provide a first clarification on the question, which classes of NPIs we are dealing with.

## 1.2. Types of NPIs

At this point it seems necessary to present the relevant facts for one of the major goals of this project: to delimitate the properties of the relevant classes of NPIs. Let us start over again with *any* in English. What is quite puzzling with this item is that it can also be used in constructions normally not attributed to NPIs, such as generic sentences (47c), with abstract nouns but without an overt licenser (47b), as a free-choice item (47d,e), or in

certain contexts even ambiguous between an existential and a universal interpretation (47f).

- (47) a. Peter didn't read any book. (existential)  
 b. The bumper prevents any damage from the car. (existential)  
 c. Any owl hunts mice. (generic)  
 d. Take any {apple/three apples}. (free choice)  
 e. Peter will buy just any book. (free choice)  
 f. If Peter can solve any problem... (ambiguous)

Another peculiarity, and in fact this is the most challenging data, is that it may even occur in sentences with a non-negative episodic interpretation. This finding goes back to LeGrand (1975) and is referred to as 'sub-triggering'. The essential restriction is that the noun phrase containing *any* must be restricted by a non-accidental relative clause. Although not resulting in general statements of the sort we would identify as such, these sentences retain some universal flavor. In particular, I would argue that they form general statements within a restricted domain of eventualities, where this restriction comes from the restrictive clause.

- (48) a. ??Yesterday, John talked to any woman.<sup>13</sup>  
 b. Yesterday, John talked to any women he saw.

Already short after Klima's work on indefinite NPIs, other items were also recognized as NPIs, some of them called 'idiomatic NPIs' or 'minimizers'. For the moment I will use Zwarts' terminology, which labels them as 'strong NPIs', subsuming both, idioms and items made up with the focus marker *even* plus 'a single N'.

- (49) a. John didn't read even a single book.  
 b. John didn't eat so much as a single pancake.  
 c. Nobody gave a red cent to charity.  
 d. John didn't lift a finger to help Mary.  
 e. The piano didn't budge an inch.

In fact, they all denote some minimal quantity or a minimal action. Together with negation, they reinforce or strengthen negation,<sup>14</sup> similar to the adverbial *at all*, (which can be

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<sup>13</sup> This sentence, I think, has a marginal reading asserting a restricted habituality, which could be paraphrased as: 'Normally, John doesn't talk to many people, but yesterday, whenever he met a woman, he talked to her.' This interpretation is clearly not available when we use progressive aspect:

i. \*Yesterday, John was talking to any woman, when he was interrupted by a phone call.

attached to these constructions throughout and in certain cases raises the potential for NPI licensing.)

Interestingly, these items differ from *any* in that they seem to require somewhat stricter licensing. The first to notice this difference was Heim (1984), strong NPIs enforce a negative interpretation, whereas (unstressed) *any* or *ever* seem to be rather neutral.<sup>15</sup> Remember that under Linebarger's account, the negative implicature is predicted, but nothing explains the neutral behavior of indefinite NPIs:

- (50) a. Every restaurant that charges (so much as) a (single) dime for iceberg lettuce  
       - ought to be closed down.  
       - ??/\* actually has four stars in the handbook.
- b. Every restaurant I have ever been to happens to have four stars.
- (51) a. Have you ever eaten any squid?  
       b. Have you eaten (so much as) a single squid? [Heim 1984]

Zwarts (1990/93, 1998), while adopting Lasusaw's proposal where the relevant licensing property of operators is downward-entailingness, regards this property as one of the weaker licensing conditions. He directly addresses the differences between NPIs by imposing additional requirements. In his terms, 'strong NPIs' require an anti-additive operator in order to be licensed. For further details see the next section, at the moment it suffices to associate 'anti-additive' with negative environments. These environments form a proper subset of the scope domains of DE operators.

In contrast to 'strong' NPIs there are also 'weak' NPIs. Depending on the version of the theory, sometimes *any* is taken as prototypical for these items; however, in other versions (see Zwarts 1990/93) certain combinations of modals with predicates are regarded as the prototypical representatives of this class. Consider the following items:

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<sup>14</sup> It is important to note, that these items themselves do not form a semantic unit with negation. Their behavior as NPIs un-misleadingly calls for a different mechanism than just associating them with sentence negation (as for example Linebarger suggests.) However, during language change the association with negation may be grammaticalized. In fact, Jespersen's cycle exactly describes this shift, where items, used as NPIs for a long time, become conventionalized as always going together with negation and in a further step they may change their grammatical status from an object or adverbial to a part of a complex negative expression. E.g., *pas* in French formerly expressing a measure for movement, then generalized as a negation marker for all predicates, and finally it may replace the former marker of negation (i.e., pre-verbal *ne*) within sentence structure. This does not mean that there may not be several markers in parallel (e.g. *rien*) or other items that are still more akin to polarity items (e.g. *personne*).

<sup>15</sup> Cf. also Lakoff (1969), who stresses the possibility of a neutral statement with *any* in questions and conditionals, as opposed to *some*, which comes along with a 'positive expectation'.



- d. \*onireftika oti irthe kanenas (factive)  
 dreamt.1sg that.IND came.3sg anyone  
 ‘I dreamt that someone came’

In St’át’imcets (a language of the Salish family) one of the determiners has very similar, if not identical properties. A DP headed by ‘*ku*’ must be in the scope of negation, a wh-operator or a modal/intentional operator (data from L. Matthewson 1996, talk given at WCCFL, UCI). Matthewson’s analysis shows that determiners in St’át’imcets do not distinguish DPs with respect to definiteness or familiarity but rather indicate assertion or non-assertion of existence.

- (55) a. tex<sup>w</sup>p-mín-lkan keł [ti púk<sup>w</sup>-a] natx<sup>w</sup>  
 buy-appl-1sg.subj might det book-det tomorrow  
 ‘I might buy the/a book tomorrow’ (novel/familiar)
- b. tex<sup>w</sup>p-mín-lkan keł [k<sup>w</sup>u púk<sup>w</sup>] natx<sup>w</sup>  
 buy-appl-1sg.subj might det book tomorrow  
 ‘I might buy a book tomorrow’

Chinese polar indefinites, which can also be used as ‘wh’-elements (cf. Lin 1995, 1996), also show this sort of behavior. They are excluded from simple declarative, episodic sentences (56a). Negation (56b), adverbials expressing modal possibility (56c) or even the aspectual particle *le* (in the particular interpretation where it expresses circumstantial inference) license these indefinites in Chinese, among some other environments.

- (56) a. \*Wo xihuan shei/shenme ren  
 I like who/what man  
 ‘I like somebody’
- b. Wo mei mai shenme (dongxi)  
 I not buy what thing  
 ‘I didn’t buy anything’
- c. Yexu ta you shenme hao de xiangfa  
 perhaps he have what good DE idea  
 ‘Perhaps he has some good idea’
- d. Ta kandao shenme \*(le)  
 he see what LE  
 ‘He [presumably] saw something’

The proposal offered by Lin is oriented towards a semantic analysis, however it does not directly target the truth conditions of the whole proposition the NPI occurs in. Rather it addresses the referential properties of the DP itself. His formulation is that “*the use of an EPW [existential polarity wh-word in Chinese] is felicitous iff the proposition in which the*

*EPW appears does not entail existence of a referent satisfying the description of the EPW.”*  
[Lin 1995: 14]

For all these items I will use the label ‘weakest NPIs’ henceforth. Extending this gross typology, one also finds in the literature reference to ‘strongest NPIs’, which require an anti-morphic operator, i.e., sentence negation expressed by a negation marker. There are two options to produce that kind of behavior. One is that a semantically triggered syntactic feature forces certain items to always co-occur with sentential negation. This is a special kind of negative concord, and I would rather not put these items to the class of ‘strongest NPIs’. The other option would be that certain items (e.g., ‘*one bit*’ in English, cf. Zwarts 1998) are tied to negation in a special way, other than strong NPIs, which are fine within the scope of an anti-additive operator, such as *nobody*.

However, negative concord items share with NPIs a great deal of similarity. So let us explore these items first. One of the NPIs described in Progovac (1994) always has to go with sentential negation, these are the NI-items in Serbian/Croatian<sup>18</sup>. Indefinite pronouns in this language form a paradigm. The base forms can be used as wh-elements: (t)ko ‘*who*’, što ‘*what*’. Indefinite pronouns are formed with the prefixes ‘*i-*’ and ‘*ni-*’ (and also ‘*ne-*’, which are PPIs very similar to *some* in English.) The NI-items must co-occur with sentence negation and only those may co-occur with sentence negation. In all other NPI contexts, I-items are appropriate.

- (57) a. Petar ne vidi ni(t)koga/\*i(t)koga  
Peter not sees nobody/anybody  
‘*Peter doesn’t see anybody*’ / ‘*Peter sees nobody*’
- b. Ne tvrdim da je vidio \*ni(t)koga/i(t)koga  
not think-I that has-he seen nobody/anybody  
‘*I don’t think that he has seen anybody*’
- c. Sumnjam da Milan voli i(t)koga/\*ni(t)koga  
doubt-1sg that Milan loves anyone/noone-ACC  
‘*I doubt that Milan loves anyone*’

Whatever meaning properties these items have, which make them into NPIs, one also has to take into account the morpho-syntactic properties of the relevant language. In Serbian/Croatian, negative concord overrides any possibility of an indefinite I-type NPI to

<sup>18</sup> I use this name (also employed by Progovac) for what is now regarded as a family of languages for political reasons, including Bosnian. To my knowledge, as far as the behavior of the items discussed here are concerned, there are no differences between those languages, or, even more relevant, between the dialectal groups. However, there are different paradigms employed; one of the primary distinctions between the major dialectal groups is based on the form of the wh-pronoun corresponding to ‘*what*’.

occur in a sentence whenever clause-mate negation is present: the NI-item must be used, morphologically marked for negation. It is important to note that Serbian/Croatian has no strict SVO order, hence the subject position does not c-command the TP/negP or wherever one assumes that V+neg is located at LF.

When there is no overt negation present, I-type items can be used, if the semantic properties are met (57b). The picture given here is not complete in many ways. Regarding Serbian/Croatian, there are also other items used as indefinites, such as free choice ‘wh+*bilo*’, which is morphologically parallel and semantically identical to English ‘wh+*ever*’ (cf. Progovac 1990). In connection with indefinite pronouns and negation, it is also necessary to mention so-called n-words in a variety of Romance languages. They differ from the Serbian/Croatian NI/I-paradigm in that they behave like NPIs under the scope of sentence negation (and other appropriate non-local licensors), but they may also convey negative force by themselves, specifically when their syntactic position is higher than the locus of sentential negation. For a comprehensive overview and analysis of negative concord in a wide range of languages, see Giannakidou (2002).

I have presented the NI-items from Serbian/Croatian first, since one could argue that they belong to the class of ‘strongest NPIs’ within Zwarts’ terminology, since they always have to co-occur with overtly expressed clause-mate negation. But actually what is going on here is a morpho-syntactic agreement between an abstract feature for negation associated with the items in question, and sentence negation itself. This type of agreement can be expressed in various ways. N-words in Romance languages for example have the property that they may express negation by themselves, hence they can only be regarded as NPIs when they are in an appropriate position to be licensed as indefinite polarity items, otherwise they have a life as negative quantifiers. Consider the following examples from Italian:

- (58) a. \*(Non) ha visto nessuno.  
       ‘*He hasn’t seen anyone.*’
- b. Nessuno (#non) ha telefonato.  
       ‘*Noone called.*’
- c. Non pretendo [che tu arresti nessuno].  
       ‘*I don’t require that you arrest anyone.*’
- d. Dubito che venga nessuno.  
       ‘*I doubt that anyone will come.*’
- e. Ha telefonato nessuno?  
       ‘*Has anyone called?*’

In (58a) *nessuno* is only grammatical if *non* is present as well, but as (58c) shows, the licensing negation need not be local,<sup>19</sup> and other NPI licensing environments, such as adversative predicates or interrogatives (58d,e), indicate that in fact we are dealing here with an NPI of some sort. Only when *nessuno* occupies the preverbal (subject- or topic-) position, it will develop negative force on its own. Any preverbal negation (*non*) will not merge with the clausal negation triggered by *nessuno* in this position, but the complex structure gets an interpretation as a double negative.

What would be more apt for illustration as an example for super-strong (or ‘strongest’) NPIs are items like ‘*one bit*’ in English, and its counterparts in various languages. Consider the following paradigm, where I use the non-vague predicate ‘*be pregnant*’, in order to exclude an interpretation as ‘*a little bit*’, which is indistinguishable in German.

- (59) a. \*She was one bit pregnant.  
 b. \*No one was one bit pregnant.  
 c. She was not one bit pregnant.
- (60) a. #Sie war ein bisschen schwanger.<sup>20</sup>  
 b. \*Niemand war ein bisschen schwanger.  
 c. Sie war {kein / nicht ein} bisschen schwanger.

To summarize, we managed to distinguish four major classes of NPIs. Employing the terminology of Zwarts we can label them according to the strength of licensing requirements, although I do not want to commit myself to Zwarts’ description of what the licensors are. Beginning with the ‘weakest NPIs’, we find a class of indefinite pronouns in a variety of languages, which preclude themselves of being interpreted existentially. These are *wh*-words in Chinese, when they are found in non-interrogative contexts, a special determiner in St’aticm’ets, a language of the Salish family, or unstressed indefinite items in Greek, as described extensively by Giannakidou (1996, 1997). The class of ‘weak NPIs’ must be split into two more or less independent proponents: the exhaustive indefinites *any* and *ever* in English, or *jemals* in German form the first subgroup, certain modal expressions like *need*+bare VP in English or *brauchen*+VP in German can be regarded as paradigmatic cases of the second subgroup. ‘Strong NPIs’ always involve the expression of

<sup>19</sup> The complement, however, has to be in subjunctive mood. This can be explained that if a complement clause is in indicative mood in the relevant languages, it necessarily receives a *de re* interpretation with respect to the embedding predicate, hence it ceases to be in the scope of the licensing operator.

<sup>20</sup> Modification of ‘being pregnant’ by ‘a bit’ is not strictly excluded, however, it results in an ironic interpretation, where ‘being pregnant’ is rendered as a vague predicate. This must be due to a conception of vagueness as applying to external evidence. Crucially, this reading is not available at all, when the subject is a negative quantifier.



minimal quantity (or action). These are to be associated with pragmatic scales, and it can be shown that exactly these items are demanding scale reversal in the classic sense in order to escape contradictory implicatures. The last group, ‘strongest NPIs’, are intimately tied to negation itself. In my view, they come together with all other items that take part in negative concord phenomena, such as n-words in Romance languages, or items normally labeled as negative quantifiers in variants that display negative concord, like Black English or Bavarian (Bayer 1990). I have included this very brief discussion for reasons of completeness, for a very comprehensive and thorough analysis items displaying negative concord effects, see Giannakidou (2000, 2002) for a theoretical outline of conceptual options I want to also refer to Ladusaw (1992).

### 1.3. NPIs, pragmatic scales, and focus

This section is dedicated to the concept of treating NPIs as scalar items. The idea is not new, there are first formulations already in Horn (1969, 1970, 1972). Fauconnier (1975ab, 1979) elaborated on this and supplied an embedding into pragmatics, by his finding that certain expressions have an (almost idiomatic) interpretation as endpoints on pragmatically defined scales. Rather recently, with Chierchia’s (2001) theory of scalar implicatures, there is a strong shift towards a semantically based analysis, but we find earlier attempts to tackle the NPI problem by the employment of scales in Lee & Horn (1994) or Lahiri (1996, 1998). Lee & Horn’s (1994) proposal for *any* in English is based on the assumption that *any* is in fact equivalent to *even a single*.<sup>21</sup> Although it appears to be obvious that this equivalence is mistaken for reasons already presented, I think that the mechanism they describe is perfectly appropriate to give a first coherent approximation of what is going on with strong NPIs. Note that *even a single N* is one of the most prominent members (and most clear to grasp) of the class of strong NPIs, and it has its polar properties devoid of any idiomatic meaning. For the remainder of this chapter I will present a brief analysis of strong NPIs based on Lee & Horn’s account plus a first approximation to Chierchia’s proposal.

#### 1.3.1. The meaning of ‘even’

There will be more to say about scales, for the moment let us start with an intuitive characterization. Scales may be construed pragmatically along a certain dimension. The crucial property of a scale is that the elements (belonging to, or defined by the given dimension) on the scale are ordered by entailment. When a proposition is true of a ‘higher’ element on the scale it must be true for any ‘lower’ element (the notions higher and lower

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<sup>21</sup> Other proposals also deal with alternative sets (Lahiri 1995, Krifka 1990, 1995). Environments that do not license NPIs give rise to contradictory implicatures, hence ungrammaticality.

referring to direction of implicature/entailment). There are various kinds of scales: scales of quantity, which give rise to an existential interpretation, scales of specificity, which we will see later can be invoked by *any* in English, or scales of probability, typically occurring in connection with focus operators.

The crucial property of most strong NPIs is that they come along with a quantitative measure, thus triggering the construction of quantitative scales. Let us start with the NPIs made up by *even a single* plus a common noun. According to Lee & Horn, the focus marker *even* in English has the semantics described below. The term ‘presupposition’ may give rise to some sort of confusion; it refers to a scalar ordering of the elements within the alternative set invoked by focus.

(61) *even* ( $\alpha, P$ ) [where  $\alpha$  is the focus of *even* and  $P$  is the proposition schema obtained by abstracting over the focus]

Assertion:  $P(\alpha)$

Presupposition: There is a likelihood scale with  $\alpha$  at the low end for which  $P$  holds, and a linear order  $>$  defined as follows:  
 $x_2 > x_1$  iff  $P(x_2)$  is more likely to hold than  $P(x_1)$ .  
 $[\forall x_i: P(x_i) > P(\alpha)]$

Implicature:  $\forall y (y > \alpha): P(y)$

The definition consists of three parts. The assertion is straightforward, whatever *even* takes under its scope as a focus marker, the proposition scheme is true of it. Second, the proposition is also true for all elements of the set of alternatives. This is the implicature part and it follows from the presupposed likelihood scale. If the proposition is true for an element it is true for all elements higher on the scale, i.e. more likely to be true. The presupposition contains an additional statement that the element in focus is the least likely to hold. Actually, this generates the implicature part of the definition that the scheme must be true of all other elements of the alternative set. Notice that this is just a description of the semantics of the focus operator *even*, nothing hinges on polarity of whatever sort. Now let us consider the meaning of the complex expression ‘*even a single*’.

(62) *even (a single N, P)*:

Assertion:  $P(a \text{ single } N)$

Presupposition: There is a likelihood scale with [*a single N*] at the low end and a linear order  $>$  defined as follows:  
 $x_2 > x_1$  iff  $P(x_2)$  is more likely to hold than  $P(x_1)$ . Therefore any  $P(x)$  is more likely than  $P(a \text{ single } N)$ .

Implicature:  $\forall y (y > a \text{ single}): P(y)$

The focus meaning of *even* is the same as described above. However, a strange effect arises. We feel that somehow it is not logical to claim that a proposition is more likely to hold for any other number of *N* than just for *a single N*. This is due to the fact that numerals can be associated with scales. Normally, numeral expressions denoting larger quantities entail expressions denoting smaller quantities (i.e.,  $5 \rightarrow 4 \rightarrow 3 \rightarrow 2 \rightarrow 1$ ). As an example, if one has eaten a quantity of 4 apples, it is obvious that any number of apples smaller than 4 has been eaten as well. In terms of likelihood, a proposition is more likely to hold when it is true in more situations. With numerals, ‘1’ is the most likely since it is true by entailment with any number greater than 1, and it therefore does not entail any other element on the scale. This, however, is exactly the reverse of what the definition in (62) poses as a demand. ‘*A single N*’ should be the least likely, and also it should entail all other numbers/quantities. The solution to this problem is to reverse the scale associated with the numeral quantifier ‘*a single*’. Scale reversing is the defining property of downward entailing functions as we have already seen in section 1.1.6, the definition repeated below in a slightly modified formulation:

- (63) If *A* and *B* are two boolean algebras, the function *f* from *A* into *B* is polarity reversing [downward entailing] iff for any  $a_1, a_2 \in A$ , if  $a_1 \leq a_2 \Rightarrow f(a_2) \leq f(a_1)$ .

[Ladusaw 1996: 324]

For presentational reasons let us reconsider the relevant examples. Typical upward-entailing (UE) environments are simple episodic, declarative statements. A typical example for DE environments is negation, but almost all polarity licensing contexts given in (1). The entailment of subsets to supersets gives a good illustration how UE/DE works. The following examples presuppose that carrots are a subclass of vegetables.

- (64) a. Peter is cooking carrots  $\rightarrow$  Peter is cooking vegetables (UE)  
 b. Peter is cooking vegetables  $\nrightarrow$  Peter is cooking carrots
- (65) a. Nobody is cooking carrots  $\nrightarrow$  Nobody is cooking vegetables (DE)  
 b. Nobody is cooking vegetables  $\rightarrow$  Nobody is cooking carrots

Provided a scale for cardinal numbers (defined by entailment) is available, then the numeral ‘1’ corresponding to the expression ‘*a single*’ gives the strongest statement under a DE operator. All other statements with potentially greater numerals are true by entailment if the statement holds for ‘*a single*’. This is exactly what we need in order to get the implicature coming with the meaning of ‘*even*’. At this point, two things still need clarification: what makes the scales ‘available’ and why are sentences without DE operators ungrammatical? The first question can be answered easily. It is the association

with focus, which invokes the scales. Focus by itself induces a set of alternatives, which in the case of ‘*even*’ are ordered with respect to likelihood, at least to the extent that the element in focus is ordered with respect to all other alternatives. When the constituent being in focus is a nominal phrase quantified by a numeral, the dimension where the alternatives belong to is cardinal numbers. Having a dimension implies that we also have an ordering (by entailment), hence a scale in the relevant sense.

The other problem is more severe. We saw that for the weakest element of a scale (‘1’ on the scale of cardinal numbers in an upward entailing context) there are no entailment relations to other elements. The likelihood scale established by ‘*even*’ requires that there is an entailment relation to all other elements, in fact, it demands that the constituent being in focus is the strongest element on the scale. So, the presupposition part of the meaning of ‘*even*’ and the scale associated with numerals contradict each other in non-DE contexts. Still, it would be more satisfying if we could actually ‘see’ this contradiction at work.

### 1.3.2. *Scalar implicatures revisited (Chierchia 2001)*

Quite recently, Chierchia (2001) has given a formal account on how scales and implicatures can be integrated into a (semantically motivated) theory of grammar. While the establishment of certain scales depends on pragmatic factors to a certain extent (determining the salience of elements belonging to a certain dimension), he argues for integrating the effect that scales have on the meaning of a proposition into the semantics of an expression. In short, the effect is that an element on a scale not only entails the truth of expressions containing lower elements, but that there is also a strong meaning associated with the scale. By implicature expressions containing higher elements on that scale are taken to be false. This stronger meaning is invoked by conventional implicature in the sense of Grice. Giving an example with apples, if a proposition asserts that *x* has eaten 4 apples, this entails any lower number of apples eaten, but by implicature it also expresses that for any number *n* greater than 4, ‘*x* has not eaten *n* apples’. In addition Chierchia provides an account for NPI *any*, building upon Kadmon&Landman (1993) and extending his analysis of scalar implicatures onto NPIs with certain provisos to be made. I will discuss his analysis of NPIs in more detail in the next chapter, however, I will argue that this kind of analysis is more appropriate to explain the properties of strong NPIs than to directly account for *any*.<sup>22</sup> Here, it should be sufficient to note that his move toward semantics gives rise to a view where scalar implicatures have to be computed not as the pragmatic company of a whole utterance, but really as a part of the meaning, thus to be treated locally and compositionally.

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<sup>22</sup> But see Chierchia (2004) for a modified approach, which in my opinion overcomes the problems raised in the discussion below.

Chierchia's (2001) work on scalar implicatures provides us with new insights and it can be shown that the immediate scope constraint formulated by Linebarger falls out naturally from the way scalar implicatures are computed. I will skip the very details of his argumentation here, but try to give a general picture of his proposal. Chierchia has two mechanisms for generating implicatures, which he derives as part of the strong meanings of operators, hence semantically: a local and a recursive part. The local part is associated with any scalar element  $\alpha$ : under its 'strengthened', or 'scalar' meaning ( $\|\alpha\|^S$ ) all elements on the scale stronger than  $\alpha$  are negated. This is done locally in the course of a compositional semantic interpretation of a sentence: "[...] *rather than introducing implicatures at the end of the computation (or at some other arbitrary stipulated site), implicatures are introduced as soon as possible after a scalar term enters the computation. The strengthened value is thus provided by the grammar. It is defeasable in the sense that whenever its addition to a given context results in inconsistency, one falls back on the plain value.*" [Chierchia 2001: 19] And further: "*The first step in defining strengthened values is identifying the relevant alternatives that enter into it. In the same spirit as Krifka's [1995] proposal, I assume that for any expression  $\alpha$ , its set of alternatives  $\|\alpha\|^{ALT}$  are a set of expressions of the same type as  $\alpha$ . [...] Now, since the plan is to deal with each implicature as soon as possible, I will define  $\alpha^{ALT}$  in such a way that it yields the alternatives induced solely by the last scalar element in the tree [...].*" If the alternatives are scalar, we can pick out the weakest member of the scale, which is still stronger than  $\alpha$  (i.e., asymmetrically entails  $\alpha$ ). (In case there is no stronger element,  $S(\alpha)$  is the contradiction  $\perp$ .) The notion of scale in this context goes back to Horn (1972).<sup>23</sup> Examples of scales triggering the implicatures we want to look at are:

- (66) a. Positive quantifier: *some < many < most < every*  
 b. Negative quantifiers: *not all < few < none*  
 c. Predicates: *cute < beautiful < stupendous*  
*discrete < good < excellent*

<sup>23</sup> These scales are sometimes referred to as 'Horn-scales'. Although he did not use these in the context of creating scalar implicatures, at least not in the style of Chierchia, he noticed the property of 'greater universality', hence asymmetric entailment.

- d. Numerals:  $1 < 2 < \dots < n < \dots$   
 e. Modals: *possibly* < *necessarily*  
*may* < *must*  
 f. Connectives: *or* < *and*

where:

$\alpha < \beta$  (“ $\alpha$  is informationally weaker than  $\beta$ ”) =<sub>df</sub>  $\beta$  (asymmetrically) entails  $\alpha$ .<sup>24</sup>

The strong meaning of an expression can be defined as follows, where  $S(\varphi^{\text{ALT}})$ , corresponds to the weakest member of the alternative set stronger than the element  $\alpha$  itself.

(67) If  $\varphi$  is a scope site (of type  $t$ ), then  $\|\varphi\|^S = \|\varphi\|^S \wedge \neg S(\varphi^{\text{ALT}})$

The recursive part works the same way as standard functional application does. If a higher operator takes a constituent as its argument, its strong meaning will be computed and applied to the strong meaning of its argument. However, this is only the case if the operator itself is not downward entailing. If an operator is DE, it will cancel the implicatures of its argument, which then only has its ‘normal’ meaning. Moreover it will introduce novel implicatures, induced by the new (DE) context, which reverts the scale associated with the embedded element. Chierchia speaks of ‘recalibration’. The DE part of his strong application looks as follows. Very informally, the scalar element in the embedded constituent  $\gamma$  loses its implicatures and keeps only its plain meaning, but indirectly it receives new implications under the DE operator  $\beta$ . Chierchia’s definition contains 2 disjunctive parts, one for non-DE contexts and a second one otherwise.

(68)  $\|\beta \gamma\|^S = \|\beta\|^S (\|\gamma\|^S)$ , if  $\|\beta\|$  is not DE, or  
 $\|\beta\|^S (\|\gamma\|) \wedge \neg S(\|\beta\| (\gamma^{\text{ALT}}))$  otherwise.

We see that the implicatures associated with the strong meanings are proliferated in non-DE contexts, whereas they are erased when  $\beta$  is DE (cf.  $\|\beta\|^S (\|\gamma\|)$ , where the strong meaning is removed from  $\|\gamma\|$ ). An important feature of this definition is that recalibration is done only once, exactly if an element is embedded under a DE operator. Let us look at examples illustrating this mechanism. Assuming that the scale of (positive) quantifiers is established and valid (i.e., *some* < *many* < *most* < *every*), we can tackle the implicatures of the sentence in (69a). Let us assume for the moment that the relevant scale is truncated and

<sup>24</sup> Chierchia is aware that entailment cannot be advocated without caution. “Two caveats are in order. First, the notion of entailment is to be understood as generalized in the usual way to all types (that “end in  $t$ ” – see Partee and Rooth 1983). Second, entailment must be understood as being relativized to contextually shared knowledge in the sense of Stalnaker (1978). See Heim (1984) and von Stechow (1999) for relevant elaborations of Stalnaker’s view.” [Chierchia 2001:4]

contains only 2 members: *some* < *every* (otherwise, the strong meaning involving *every* could be inferred by entailment anyway).

- (69) a. Some student did well  
 b.  $\exists x$  [student(x)  $\wedge$  did well(x)] (Some and possibly all students did well)  
 c.  $\neg \forall x$  [student(x)  $\rightarrow$  did well(x)] (Not every student did well)

The LF in (69b) corresponds to the plain meaning of (69a), whereas the LF in (69c) expresses the implicature supplied by the computed strong meaning. The next example involves the connectives *or* and *and*. It is a well known fact that *or* has 2 meanings, an exclusive one, where the operator returns true if either one of the formulas within its scope is true, but not both, and an inclusive one, which returns true also if both of the formulas are true. A simple table of truth values may illustrate this:

(70)

p	q	$p \wedge q$	$p \vee q$ (inclusive)	$p \vee q$ (exclusive)
0	0	0	0	0
1	0	0	1	1
0	1	0	1	1
1	1	1	1	0

In Chierchia's proposal the ambiguity of *or* can be reduced to the difference between the plain meaning without implicatures (inclusive) and the strong meaning (exclusive), which introduces an implicature explicitly negating that both arguments of the connective may be true.<sup>25</sup> In order to illustrate the connection to a Gricean perspective of pragmatics, consider the following example:

- (71) a. Who is in that room?  
 b. John or Bill.  
 c. John and Bill. [Chierchia 2001, ex. 6]

Citing the original argumentation: “*Suppose a hearer gets (6b) as an answer to question (6a); s/he will then typically come to conclude that the answer in (6b) implicates that (6c) does not hold (i.e. that John and Bill are not both in the room) in the following (idealized) way:*”

<sup>25</sup> But see Sauerland (2004) for a critical view against the treatment of exclusive *or* in terms of simple scalar implicatures and an analysis involving epistemic alternatives, and also Fox 2006 for an attempt to remedy the original idea..

- (72) i. The speaker said (71b) and not (71c), which would have been also relevant  
 ii. (71c) entails (71b) [*or* and *and* are part of a scale]  
 iii. If the speaker had the info that (71c), she would have said so [quantity]  
 iv. The speaker has no evidence that (71c) holds  
 v. The speaker is well informed  
 Therefore:  
 vi. It is unlikely/not the case that (71c) holds [Chierchia 2001, ex. 7]

Stacking various operators, all of which are not DE, will result in a list of implicatures, each of them computed locally. As we proceed with the computation, we end up with the strongest meaning in (73b.iii.), and this will be the meaning of the sentence in (73a), unless it is blocked by some contextually available information. In that case some weaker meanings may turn out to be appropriate.

- (73) a. Someone smokes or drinks  
 b. i. someone'( $\lambda x$  [smoke'(x)  $\vee$  drink'(x)])  
 ii. someone'( $\lambda x$  [[smoke'(x)  $\vee$  drink'(x)]  $\wedge$   $\neg$  [smoke'(x)  $\wedge$  drink'(x)]])  
 iii. someone'( $\lambda x$  [[smoke'(x)  $\vee$  drink'(x)]  $\wedge$   $\neg$  [smoke'(x)  $\wedge$  drink'(x)]])  
 $\wedge$   $\neg$  everyone'( $\lambda x$  [smoke'(x)  $\vee$  drink'(x)]) [Chierchia 2001, ex. 77]

The cases relevant for our discussion are the ones where a scalar item is embedded under a DE operator. By definition, the implicatures arising in an earlier step are erased, if there are any; and new ones are added in accordance with the new (reversed) scale of entailments. The intermediate set of implicatures contains those, which are indirectly generated under the DE operator. In the case of *or* there are none, since under DE *no one*, *or* is the strongest member of the scale [*or*  $>$  *and*]<sub>DE</sub>. *No one* by itself does not create any implicatures either, since it is the strongest member of the negative scale. Hence, (74a) remains without further implicatures.

- (74) a. Noone smokes or drinks  
 b. i. noone'( $\lambda x$  [smoke'(x)  $\vee$  drink'(x)])  
 ii. noone'( $\lambda x$  [[smoke'(x)  $\vee$  drink'(x)]  $\wedge$   $\neg$   $\perp$ ])  
 iii. noone'( $\lambda x$  [[smoke'(x)  $\vee$  drink'(x)]  $\wedge$   $\neg$   $\perp$ ])  $\wedge$   $\neg$   $\perp$

The situation is different when we consider *and* under a DE expression. As expected, we find a strong meaning equipped with an implicature containing *or* as the stronger member.



- (75) a. Noone smokes and drinks
- b. i.  $\text{noone}'(\lambda x [\text{smoke}'(x) \wedge \text{drink}'(x)])$   
 ii.  $\text{noone}'(\lambda x [[\text{smoke}'(x) \wedge \text{drink}'(x)] \wedge \neg [\text{smoke}'(x) \vee \text{drink}'(x)]])$   
 iii.  $\text{noone}'(\lambda x [[\text{smoke}'(x) \wedge \text{drink}'(x)] \wedge \neg [\text{smoke}'(x) \vee \text{drink}'(x)]]) \wedge \neg \perp =$   
 $\text{noone}'(\lambda x [\text{smoke}'(x) \wedge \text{drink}'(x)]) \wedge \neg \text{noone}'(\lambda x [\text{smoke}'(x) \vee \text{drink}'(x)]) =$   
 $\text{noone}'(\lambda x [\text{smoke}'(x) \wedge \text{drink}'(x)]) \wedge \text{someone}'(\lambda x [\text{smoke}'(x) \vee \text{drink}'(x)])$

If an operator intervenes, it depends on the nature of that operator if the DE property can apply to a structurally lower element. Thus we can give an explanation to the observed intervention effects, which led Linebarger to propose her Immediate Scope Constraint. Let us assume a structural configuration where X is a DE operator, Y is a universal operator like *every* and Z is a strong NPI, demanding to be in the scope of X. ((77) is Linebarger's original example.)

- (76) a. [...X...[...Y...[...Z...]] ] ]  
 b. \*It is not the case that every boy has any potatoes

- (77) John didn't give a red cent to every charity
- i. #NOT  $\exists x$  (x an amount of money)  $\forall y$  (y a charity), (John gave x to y)  
 ii. \*NOT  $\forall y$  (y a charity),  $\exists x$  (x an amount of money), (John gave x to y)

The implicatures of Z alone lead us into contradiction, as seen before with strong NPIs, we need Z to be in the scope of X, a DE operator. Structurally, this is the case. Let us briefly repeat the argument using Chierchia's terminology. It will be interesting to see how 'idiomatic' NPIs work. First consider the case where no licenser is present.

- (78) a. \*John gave a red cent to charity  
 b. \*John read even a single book

Z is a scalar element denoting minimal quantity. (In (78a), together with the predicate 'give' it might express minimal action.) Actually, '*a red cent*' refers to an amount of money not worth mentioning. Associated with quantity there exists a (maybe pragmatically motivated) scale, where Z is located on the low end. Under the strong meaning, there is an implicature that for any action that is not minimal (or for any amount of money larger than a 'minimal' amount, or for any quantity of books larger than 1) the sentences should not be true. The idiomatic nature of the expression '*a red cent*' prohibits an interpretation where it could be interpreted referentially meaning just some small amount of money. It only expresses the minimal endpoint of a scale. (78b) would be fine if *even* were not present, *a single N* can notwithstandingly have a referential meaning; compare the same sentence with *only* instead of *even*. The scale itself provides us with a set of alternatives (amounts of

money, action, books). Those alternatives are dealt with focus. In (78a) contrastive focus or a salient *only* would need a legitimate referent in order to make an assertion that makes sense. For the moment let us assume a salient ‘*even*’ associated with these items, much in the spirit of Lee & Horn. In (78b) *even* is already present. Then the set of alternatives (quantities larger than the minimal one) should be true, actually they are even more likely to hold than the item in focus. Exactly at this point of processing we get a direct contradiction to the implicatures generated by the strong meaning of Z.

(79) a. give a red cent (to charity)

STRONG:  $\Rightarrow$  not give an amount larger than a red cent

EVEN:  $\Rightarrow$  give any amount larger than a red cent

b. read even a single book

STRONG:  $\Rightarrow$  not read 2 books (or more)

EVEN:  $\Rightarrow$  read any amount of books larger than 1

If we embed Z, the scalar expression functioning as a NPI, under a DE operator, the scale is reversed and the original implicatures generated as the strong meaning are removed, hence the contradiction disappears. Theoretically, new implicatures should arise, but not in case of a minimal quantity, since it marks the endpoint of the scale and there are no elements on that scale lower than the minimum.

What would be interesting to do is to investigate how NPIs behave in more complex structures. So far we have seen that strong NPIs have to be in the scope of a DE operator and that we have to consider potential existential implicatures. How close must the relation between the operator and the NPI be? Reminiscent of Linebarger’s ‘Immediate Scope Constraint’ we may guess that the relation must be quite local. An explanation for this constraint has been desirable for a long time.

Now back to the configuration where a universal quantifier intervenes between the potential licenser X and the scalar element Z. Remember that implicatures are computed step by step, so first we have to consider the effect of Y onto Z. It has none, since the universal operator is not DE in its scope. The contradicting implicatures remain active. The problem now is, that the DE operator X, which has rescuing potential, cannot change the implicatures of Z directly, it can only work on Y’s implicatures. Now suppose that every itself is part of a scale of quantifiers in the sense of Horn (1972), where it is the strongest member of that scale. Being the strongest means that it entails the weaker ones (*every*  $\rightarrow$  *many*  $\rightarrow$  *some*). The strong meaning of a sentence containing a universal quantifier does not contain any new negative implicatures. But under a DE operator (X) the picture changes, the weaker alternatives to every become stronger ones and are (doubly) negated, as part of the strong meaning of X(Y).

$$(80) \quad \|\text{not}(\text{every})\|^S = \|\text{not}\|^S (\|\text{every}\|) \wedge \|\text{not}\| (\|\text{many}\|)$$

By virtue of the implicature generated by X, the negation, on Y, the universal quantifier, the strong NPI Z is not in a DE context in one of the implicatures, and this violates the conditions we have formulated on strong NPIs. The same reasoning applies to the Coordinate Structure Constraint formulated by Ross (1967). As we have already seen before AND and OR can be regarded as forming a scale. AND, where both arguments must be true entails OR, where only one argument needs to be true. In its strong meaning, OR asserts that one argument has to be true, but not both arguments.

$$(81) \quad \|\text{P OR Q}\|^S = \|\text{P OR Q}\| \wedge \|\text{P AND Q}\|$$

In a DE environment AND becomes the weaker element and it generates an implicature where OR is negated. Together with the DE operator the implicature expresses that either one of the two conjuncts may be true. But this sort of implicature is in conflict with the licensing conditions of strong NPIs.

$$(82) \quad * \text{No student read an article by Chomsky and even a single book.}$$

There is another question we can answer now: why is it the case that double negatives license (strong) NPIs freely, although truth conditionally the two negations cancel each other out and the sentence directly entails a proposition where the NPI is no longer licensed?

$$(83) \quad \text{It is not the case that Peter didn't read even a single book.}$$

By virtue of Chierchia's definition of strong application, this is no longer mysterious: the strong NPI is licensed locally by being in the scope of the lower negation, which is DE. Double negations may cancel out, but no novel implicatures arise where the NPI would cease to be in the scope of a DE operator.<sup>26</sup> Two problems have to be solved, still. If the two negations are within the same clause, but in a configuration that inhibits a reading in which the first negative constituent is a contrastive topic with respect to the second negation, then the sentence is no longer grammatical. This may be due to the specifics of

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<sup>26</sup> Chierchia does not say much about strong NPIs, he rather uses *any* as the prototypical NPI and refers back to K&L's characterization of the meaning of *any*. In order to build in locality he relativizes the semantics of *any* to quantificational domains and introduces a condition on universal closure, which has to be fulfilled in the scope domain of the immediately accessible operator. Relativization might be in order, but I have the intuition that it might be necessary to tie it to focus domains, thus directly connecting the semantics of strong NPIs (which involve focus and thereby create scalar alternatives on their own) with the locality effects of DE-operators licensing NPIs.

contrastive topic and focus, similar to the examples with VP-topicalization and NPIs. A more detailed investigation of these phenomena will be presented in chapter 3.

- (84) a. ?None of the students gave no charity a red cent  
 b. \*None of the students gave a red cent to no charity

The other problem concerns those DE-operators, which are not anti-additive in the sense of Zwarts. As we have already seen before, *at (the) most* gives rise to an existential implicature which inhibits the proper use of a strong NPI. If anti-additivity were the correct condition, then bare *few* should also yield an unacceptable sentence, which is not the case.<sup>27</sup> This points to the conclusion that our characterization of the licensing conditions of strong NPIs is correct and that anti-additivity is not a proper formalization of the conditions for this type of polarity items. Surprisingly, *few* interacts with negation in an unexpected way: if it is in the scope of negation, then it loses its DE-characteristics (85c,d). However, a simplistic compositional treatment that would merge NEG with *few* resulting in *many*, must definitely be wrong, since NEG plus *many* should then be interpreted as *few* and license strong NPIs. This expectation turns out not to be true (85e).

- (85) a. ??At (the) most 3 students read even a single book.  
 b. ?Few students read even a single book.<sup>28</sup>  
 c. \*Never did few students read even a single book.  
 d. \*It was never the case that few students read even a single book.  
 e. \*Never did many students read even a single book.

The explanation rather lies in the computation of scalar implicatures, again. For (85e) we only need to consider the lexical scale already used by Chierchia, something like: *every/all* → *many* → *some*. It is just an instance of the (reinterpreted) immediate scope constraint: the implicature *many* generates under negation does not match our licensing condition, since it explicitly asserts the existence of a referent. ('*Not many but some.*') The case with *few* under negation is a bit more complicated. If we would like to do it the same way, the question arises, which is an appropriate scale for *few*. Up to now we have dealt only with scales where all elements are upward entailing. Formulated differently, what is the strong

<sup>27</sup> As already indicated, the grammaticality of this example may be not as robust as indicated here. However, if we replace the strong NPIs with *any* or *ever*, then this problem disappears, and the contrast between a licensed NPI within the scope of *few* and the disappearance of the license, when the structure is embedded under negation/a higher DE operator, is indisputable.

<sup>28</sup> An alternative approach, deviating from what is discussed below, would be to treat the (slightly marginal though) acceptability of this sentence along the line, Chierchia is taking to explain the (unstable) lack of intervention effects with *many*. Unless forced by pragmatic reasons, or because it is associated with focus, a quantifier like *few* need not activate its scalar alternatives, i.e., trigger scalar implicatures.

meaning of an expression with *few*? In accordance with Chierchia it would be possible to propose a condition on the construction of lexical scales, in the sense that a scale can only consist of elements with the same monotonic properties. *Few* would then reside on a (negative, as Chierchia suggests) scale together with *no*. Consider Chierchia's example of implicatures arising with the quantifier *few*:

(86) Few people that smoke and drink live to be 80.

Expected implicatures:

- a. Some people that smoke and drink live to be 80
- b. It is not the case that few people that smoke and drink live to be 79  
( $\approx$  some people who smoke and drink live to be 79)
- c. It is not the case that few people who smoke or drink live to be 80  
( $\approx$  some people who smoke or drink live to be 80). [Chierchia 2001, ex. 88]

The first implicature (86a) arises from the strong meaning of *few* being part of a scale together with *no*, where *no* is the stronger element. Remember that the (immediately) stronger element is negated in the generated implicature, and *no* together with negation can be replaced by *some*. The other two implicatures are simple applications of the rules for calculating scalar implicatures for the connective AND and for numerals (in a DE environment). What is of particular interest is the first implicature, since it definitely is an existential implicature and should not allow licensing of (strong) NPIs. Accommodation (removing pragmatically infelicitous implicatures by restricting the domain of quantification) cannot be the way out, since an existential implicature is in no sense infelicitous with an expression headed by *few*. There are three options to solve this problem: one would be to challenge the implicature in (86a) as such, another option would be to find a way make it ineffective in the licensing of the NPI, and finally it could be that it is not the right implicature at all. If the implicature did not exist, we would not run into troubles with strong NPIs. The idea behind is to deny the existence of a negative scale with *few* and *no* as members. Under a negative perspective it might be true that a sentence with *no* is stronger than a sentence with *few*, but could one claim that one would entail the other? If the answer is no, then there is no scale and the strong meaning of *few* does not result in an existential implicature. However, this is not a desired move, and in the light of semantic strength of statements, *few* and *no* are connected as if they were part of a scale. For an illustration, consider Horn's (1970) observation that implicatures (in our terms) may be suspended only if they lead to greater universality, i.e., if the suspension leads to a stronger statement.

- (87) a. some if not many... vs. \*many if not some...  
 b. many if not most... vs. \*most if not many...  
 c. most if not all... vs. \*all if not most...

In negative contexts, or with DE expressions, the direction is the reverse, just as expected if the scales really have to consist only of elements with the same monotonic properties:

- (88) a. seldom if ever vs. \*never if (not) seldom  
 b. few if any vs. \*none if (not) few

Stronger elements on a scale lead to a stronger statement, by definition. Hence the scale is more than plausible, in fact I see no way to maintain the first option.

The second option is what Chierchia (2001) proposes in connection with the NPI *any*. His analysis of the similarities and differences between the computation of scalar implicatures and licensing of NPIs (it is mainly concerned with *any*) will be presented in section 2.2.3, suffice it to say that it is basically a reinterpretation of K&L's account, embedding their concept into the much broader context of scalar implicatures and domains of quantification. In a nutshell, *any* is in complementary distribution to plain indefinites and contributes to a wider meaning. In parallel to the demand for greater universality, a statement with *any* must also lead to a stronger meaning of the sentence, compared to the sentence with the plain indefinite, otherwise its use is blocked. Chierchia realizes that *few* creates a problem, since the positive implicature under discussion does not lead to a stronger meaning of the whole sentence (when compared with the competing plain indefinite). Consider the following sentence, where the strong meaning of (89) can be paraphrased as (90a).

(89) Typically, few students know any linguistics [Chierchia 2001, ex. 144]

- (90) a. Few students know any linguistics but some do  
 b. Few students know some linguistics but some do [Chierchia 2001, ex. 145]

Chierchia provides a work-around for these cases and accounts for this fact relying on the (procedural) interaction of the locality of NPI licensing on the one hand and of the computation of scalar implicatures as an interpretive device to create strong meanings. In the intervention cases (the integration of the Immediate Scope Principle by Linebarger), the licenser, a DE operator, is separated from the NPI by a scalar term. Before being able to license the NPI, cancellation of the direct implicatures has to take place, and the indirect implicatures arising with the DE expression have to be computed. Earlier I have proposed that licensing is inhibited if implicatures arise in which the NPI would not be licensed. The case with *few* is exactly the opposite. Being a DE expression immediately scoping over the

NPI, it may license the NPI first, and only thereafter the direct implicatures, which are part of the strong meaning of the licenser, are computed. Again, Chierchia has to rely on the locality of licensing, once licensed, the NPI is licensed forever, throughout the whole process of computation of implicatures. This explanation is very attractive and seems to be generally plausible. Especially with *any*, for which Chierchia's account is designed and which occurs much more freely than strong NPIs, it seems to be correct. However, it treats NPI licensing more like the saturation or checking of some feature. This may or may not be appropriate with *any*, but in the case of strong NPIs we have already seen that their behavior can be best explained if we consider the scalar implicatures associated with the items themselves. And this does not sound like feature checking.

I would like to propose a third option, which may also lead us to a better understanding of the relevant properties of operators capable of NPI licensing. Consider the simple version of a sentence with an NPI and *few* as its licenser, and let us assume that *few* actually forms a scale with *no* as the strongest member. (In that sense it would mean something like 'almost no X' or 'no X with a few exceptions'. Judgements with *few* and strong NPIs are not that straightforward, and people who do not fully accept these sentences may interpret *few* as denoting just a small quantity, but then it loses its DE-ness.) The strong meaning of (91a) is expressed by (91b), the implicature induced by computation of the strong meaning being apparently (91c) but not necessarily (91d).

- (91) a. ?Few students read even a single book
- b. Strong meaning (preliminary):  
Few students read even a single book and (it is) not (the case that) no student read even a single book
- c. ⇒ It is not the case that no student read even a single book
- d. ⇒ #Some students read even a single book

I think that this is the crucial point: although (91c) entails (91d), the existential implicature which would block NPI licensing is not the direct implicature of (91a). Rather it is a paraphrase of the implicature in (91c), which contains a double negation. But we have seen before that double negations nevertheless do license strong NPIs (and NPIs in general). Primarily, I see no need to order the computation of direct and indirect implicatures and NPI licensing as long as strong NPIs are concerned. (See chapter 3 for a more elaborate analysis of these data.) Still, it would be desirable to find a less stipulative explanation for the locality of NPI licensing within the frame proposed. The crucial data is the one in (85c,d), where *few* does under no circumstances license a strong NPI when it is in the scope of a higher negative. If licensing were simply confined to locality, as Chierchia suggests (but for exhaustive indefinite NPIs like *any*), higher negation should not play any

role, just as in the cases with double negation. But this seems not to be the case. Maybe it helps to carefully investigate the scalar implicatures arising in this constellation. Let us consider a sentence like (85c) repeated below. The offending indirect implicature, arising from the scalar term *few* under DE negation, is given in (92b). I assume that the negative scale, on which we have located *few* and *no* so far, extends into the other direction as well. It is not entirely clear, what the successor to *few* exactly is on that lexical scale, it could be *many*, or some abstract quantifier meaning ‘more than few’. What is crucial is that this quantifier is no longer downward entailing.

- (92) a. \*Never did few students read even a single book  
 b. NOT never did more than few/many students read even a single book

Since *few* is sensitive to DE-ness itself, it generates different implicatures when it is in the scope of a DE operator itself. The strong NPI is no longer licensed there by a DE-operator. Chierchia’s locality does not apply here, since it is not the indirect implicatures of an intervening scalar element induced by the licensing DE operator, but the indirect scalar implicatures induced by the licenser itself, which inhibit NPI licensing. So the ‘once licensed – forever licensed’ hypothesis cannot be maintained in its simple form. In a way, this configuration is very similar to the intervention cases discussed earlier, the only difference that the licenser itself behaves like an offending intervener. The real surprising fact is that the NPI may not be licensed by the higher negation (e.g., by *never*) in the implicature. If we take a closer look at Chierchia’s original proposal, we might come closer to a solution. He proposes a mapping hypothesis between the (quantificational) domain of a DE head and an operator ranging over domain expanding functions. Whatever the details are, this domain must provide universal closure for the NPI in order to be licensed. If we restrict ourselves to domains rather to a rigid licensing procedure, we can explain the fact that a quantifier like *few* can act as a licenser in one context but lose its licensing capacities under a higher DE operator. It creates the relevant quantificational domain and a NPI must be in a DE context within that domain, both, in the plain assertion and within resulting implicatures.

But if we also consider the quantificational domain within the implicature, which is a desirable move, then we should re-investigate other problematic cases. Let us start with double negation.

- (93) a. +DE ... NEG ... NPI  
 b. Few students/no student gave no charity a red cent  
 c. On few occasions/never did none of the students read even a single book



As already known, these are grammatical. If we check the implicatures, we see that *no* is replaced by the next stronger member on the scale. Being in a DE environment, the next stronger is *few*, which is still DE. Hence double negation is unproblematic. Next, let us try out the restriction of a universal quantifier. We saw before that universal quantifiers are potential interveners between a DE licenser and a NPI, but we did not check what happens if the universal quantifier was the licenser itself, the NPI being not in the nuclear scope but in the restriction. In the light of what we have experienced so far, the result is not as grammatical as expected under a procedural licensing account:<sup>29</sup>

- (94) a. DE ...  $\forall$  [<sub>restr</sub> ... NPI ... ] [ ... ]  
 b. ??Never will every student who budges an inch be punished  
 c. ??Never did every student who read even a single book get a good grade

Just as in the intervention cases, every in the scope of a DE head triggers indirect implicatures where the NPI is no longer in the scope of a DE functor within the relevant quantificational domain. This seems to indicate that the relevant domain is in fact the domain of the DE head functioning as the licenser for the NPI.

There is one potential counterexample to the immediate scope requirement: the quantifier *many*. It is upward entailing, but it does not count as an intervener, so a higher DE operator may well license a strong NPI in the scope of non-offending *many*. Consider the following examples.

- (95) a. \*Many students have read even a single book.  
 b. ?Never did many students read even a single book.  
 c. ?Not many students read even a single book.

Here we face two problems. The first one is why the examples are grammatical (although maybe a bit marginal) at all, since we would expect some existential indirect implicature with *many* if we conceive it as part of a fixed lexical scale <*some, many, every*>. The second is that the NPI is not licensed within the quantificational domain of *many*, but it can be licensed by a higher negative quantifier or by negation. As for the latter problem, it seems to indicate that it is in fact the immediately structurally accessible domain of a DE head, which counts as the relevant quantificational domain. Non-DE heads intervening between the licenser and the NPI enter scalar computation and it depends on their scalar

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<sup>29</sup> The results are not that bad as in the examples with *few* under negation. This might be due to the fact that the NPI is located in a relative clause serving as the restriction of the quantifier. When computing the relevant implicature for the universal under negation, some people might ‘freeze’ the restriction, i.e., treating the relative clause as an opaque domain.

nature whether they give rise to indirect implicatures inhibiting the licensing of the NPI in question.

As for the first problem, Chierchia (2001) discusses an interesting effect with *many* in connection with his ‘axioms on scales’. He notices that the relevant scales are not always unambiguous, or maximal. Consider the following example.

(96) I have many matches left.

The quantifier *many* presupposes some total amount of matches, it could be contextually determined by a matchbox. In the strong meaning the sentence either implies that I have no longer the total amount of matches, or that I don’t have most of the matches left. This corresponds to two potential minimal scales <*many, most*> or <*many, every*>. The scale could consist of more salient items, such as <*some, many, most, every*>, but with no additional effect. The implicature uses the next stronger element, and weaker elements do not give rise to direct implicatures at all. This calls for a device, which regulates which elements have to be contextually salient, i.e., constituting the scale.<sup>30</sup> Chierchia calls it a set of axioms, but I think these axioms may be related to the way strong meanings are computed, including the tendency towards greater universality. In short these axioms say that also only a subset of a lexical scale may be salient, but that this subset must contain at least two elements and that the scalar item in question must not be the strongest element, if possible. Concerning *many* this means that our two scales for the example above are correct, but a (sub-)scale like <*some, many*> would not be, since *many* would then be the strongest element (and no direct implicature could be computed.)

Considering subparts of scales as relevant in a given context has interesting consequences for indirect implicatures. Under negation, *many* is vague in its strong meaning whether there is an indirect implicature about smaller amounts or not. The following sentence is ambiguous, depending on the (sub-)scale we choose, if it is the maximal scale, then it implies that there are at least some matches left, but with the two scales from above, this implicature is missing.

(97) I don’t have many matches left.

If the implicature with ‘some matches’ is absent, the sentence may also convey that I have ‘no matches’, with a slightly raised tolerance toward exceptions. Chierchia attributes this mechanism of scale truncation also to be the reason why a sentence like ‘I don’t have much

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<sup>30</sup> Cf. Chierchia (2001, sect. 3.3): “*Knowledge of scales is part of our knowledge of the lexicon. But when a scale has more than two elements (and possibly, like with numerals, a potential infinity of elements), the context may select some subset of such elements. I.e., not every element of a scale needs to be salient (and hence in consideration) in any given context.*”

time’ can be used to convey that one has in fact ‘no time’. Here we come in with strong NPIs. The sentences in (95b,c) are felicitous if we select a legitimate scale associated with many, on which no weaker elements are present (e.g., some). Then the NPI is licensed by negation and no indirect implicature arises with many at all.

At this point it might be useful to spend some thoughts on locality again. First it was introduced by Linebarger, who tied NPI licensing to sentence negation and imposed an additional requirement, that the NPI be in the immediate scope of negation. Her restriction to sentence negation made it necessary to assume also an indirect licensing by negative implicatures. We will see that the latter is better replaced by a ban on positive, or existential, implicatures. Treating (strong) NPIs as scalar items (first proposed by Fauconnier) led us to adopt Ladusaw’s original proposal: the crucial property of licensors for NPIs is in fact their scale reversing property: downward entailingness. But the whole story makes only sense in the framework developed by Chierchia (2001). His basic claim is that (scalar) implicatures are computed at each step of the derivation and based on a semantic treatment of strong meanings. Strong NPIs carry along their own (universal) implicatures by virtue of a salient or overt focus operator (even in English), which is also responsible for their scalar nature by introducing alternatives. However, these implicatures contradict the implicature derived from the scales in non-DE contexts, when the strong meaning are considered. But the local computation of implicatures has more consequences: Linebarger’s intervention effects can be derived very elegantly. This makes locality (in the sense of a stipulated Immediate Scope Principle) suspicious of being an epiphenomenon. There are two empirical facts though, which still suggest that locality plays some role: double negation can be regarded as resulting in a positive statement by entailment, but NPIs are still licensed. And the case of few suggests that sometimes licensing of NPIs takes place prior to computing (direct) implicatures.

Chierchia attempts to base the locality of NPI licensing on the formalisation of the Mapping Hypothesis. Crucially, the mapping is only concerned with +DE heads, so the intervention effects discussed earlier are still treated as a derived property of certain constellations. But in addition to all these empirical facts I have shown that certain DE operators, particularly those which are not anti-additive in the sense of Zwarts (1990) can also act like interveners when they are in a DE context themselves. It was easy to show that this follows from Chierchia’s computation of scalar implicatures straightforwardly. But when all operators and proper quantifiers act as potential interveners and when it is also clear that the reason for those which do not behave in that way (anti-additive operators) lies in the specifics of the computation itself, then the question arises if we need a specific recurrence to locality. The answer is: yes, but only once. Locality was introduced right at the beginning of Chierchia’s discussion on the computation of implicatures, and there is nothing more to say. The ‘roofing effect’ described by Chierchia (the apparent strict



the effect of getting fed up the fourth or fifth time is precluded. However, the scalar nature of NPIs comes out quite naturally. From this Krifka proposes two assumptions that should guide the behavior of NPIs like *anything*: “(a) NPIs introduce alternatives; and (b) the alternatives induce an ordering relation of semantic specificity, where the NPI itself denotes a most specific element in that order.” [Krifka 1995:8] Semantic specificity is taken as strength, where strength itself can be defined as (asymmetric) entailment. The formulation of this passage to me is a bit misleading since it anticipates rather than deduces the effect that NPIs are only appropriate in a semantic context where they turn out to be the most specific element.

### 1.3.3.1 Weak NPIs: unstressed ‘any’

Let us follow systematically the classification of NPIs proposed in Krifka (1995), as I would like to present each of the semantic explanations he gives to the behavior in detail. We have seen that NPIs involve a scalar dimension with alternative elements. This can be viewed as very similar but not necessarily identical to elements in focus. With focus, it is well established that there is some sort of abstraction of a foreground over a background, which represents its syntactic/semantic context, and a set of alternatives the background is also applied to. However, the question still arises how we get the alternatives? Krifka suggests a direct analogy of NPIs to items in focus (cf. Rooth 1985, 1992). Furthermore he employs the formalism of structured meanings in order to incorporate alternatives (cf. Jacobs 1984, von Stechow 1990). In that frame we get triples  $\langle B, F, A \rangle$ , where B stands for the background, F for the foreground (the NPI, or the item in focus) and A is the set of alternatives to F containing elements of the same type but excluding F. The standard meaning of an expression can be viewed as the background B applied to the foreground F: B(F). The NPI *anything* can now be represented as the following structure:

(101) *anything*:  $\langle B, \text{thing}', \{P | P \subset \text{thing}'\} \rangle$ <sup>31</sup>

To quote Krifka: “Here, **thing** [see fn. 31] is the most general property (a notion that depends on the context and on selectional restrictions in ways that are not accounted for here). The precise nature of the background B is a function of the syntactic position in which *anything* occurs, e.g. as object of subject. The alternatives are a set of properties that are stronger than the most general property, **thing**. For simplicity of exposition I will assume that every property that is more specific than **thing** is an alternative.” [Krifka 1995:8f] What is important is that weak NPIs of the unfocused any X type carry along a

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<sup>31</sup> In the original text, Krifka uses boldface font to indicate that an item expresses the meaning of given word or phrase. Instead, I will always use the more common convention: a suffixed apostrophe.

requirement for exhaustivity. All the alternatives together make up the foreground. I understand this requirement to express the notion of ‘most general property’: any element of the alternative set, no matter of how specific it is, happens to fulfil the description provided by the most general property thing’.

(102) Exhaustivity requirement:  $\cup \{P|P \subset \text{thing}'\} = \text{thing}'$  [Krifka 1995, ex. 24]

A simple sentence with *anything* in object position would have the following tripartite BFA-structure. I quote both possibilities – one with and one without negation – and use the conventions and assumptions employed in Krifka: there is explicit reference to possible worlds,  $\alpha_i$ , short for  $\alpha(i)$  is the extension of  $\alpha$  at world  $i$ .  $R(x,y)$  stands for  $R(y)(x)$ .

(103) a. \*Mary saw anything.  
b. Mary didn’t see anything.

(104) a.  $\langle \lambda Q \lambda i \exists y [Q_i(y) \wedge \text{saw}'(\text{Mary}', y)], \text{thing}', \{P|P \subset \text{thing}'\} \rangle$   
b.  $\langle \lambda Q \lambda i \neg \exists y [Q_i(y) \wedge \text{saw}'(\text{Mary}', y)], \text{thing}', \{P|P \subset \text{thing}'\} \rangle$   
[Krifka 1995, ex. 26,27]

Within the background  $B$ , there is abstraction over possible worlds ( $i$ ) and over the property  $Q$ . If we apply  $B$  to the foreground  $F$  in (104b), we get the proposition  $\lambda i \neg \exists y [\text{thing}'_i(y) \wedge \text{saw}'(\text{Mary}', y)]$ , which corresponds to the set of worlds in which Mary saw nothing. There is also a set of alternative proposition which is construed when we apply the background  $B$  to the elements in the alternative set  $A$ :  $\{p | \exists F' [F' \in A \wedge p = B(F')]\}$ . The logical relationship between the foreground  $F$  and its alternatives  $F'$  is tied to the logical relationship between the proposition we get while applying  $B$  to  $F$  and the propositions we get when applying  $B$  to the elements from the alternative set. By definition,  $F$  is weaker than any of the alternatives (if an item fulfils some more or less specific property it will always fulfil the most general property). In the positive case, this ordering is preserved. Any application to one of the alternatives  $B(F')$  will entail  $B(F)$ . With negation, this relation is reversed,  $B(F)$  entails any alternative  $B(F')$ . So far, semantics tells us nothing what to do.

At this point Krifka brings in the pragmatics of assertion. Based on a standard theory of assertions (cf. Stalnaker 1972), he proposes (stipulatively, as he concedes) an assertion operator – Assert’ – that has as its function to update the common ground  $c$  with the proposition it is applied to.

- (105) Assert' ( $\langle\langle B, F, A \rangle\rangle$ )(c) =  $c \cap B(F)$ , iff B(F) is assertable w.r.t. c, and
- (a) for all  $F' \in A$  such that  $c \cap B(F') \neq c \cap B(F)$ : the speaker has reasons not to assert B(F'), that is, to propose  $c \cap B(F')$  as the new common ground.
  - (b) There are  $F' \in A$  such that B(F') is assertable w.r.t. c, and  $c \cap B(F') \neq c \cap B(F)$ .
- [Krifka 1995, ex. 28]

If one of the two conditions is not met then the assertion itself is undefined. In other words, either if there are no assertable alternatives  $F'$ , whereas assertable means compatible with the context already established so far, the assert relation fails on the tripartite structure, since there are no accessible alternatives. Or – as formulated in (a) – a pragmatic principle is violated, since the speaker indeed should have said something different (chosen one of the alternatives instead). Notice that Krifka makes only indirect reference to pragmatic principles. In a minute it will become clearer what he means with ‘having reasons not to assert an alternative’, when we discuss scalar assertions. Just to contemplate on that matter on this abstract level: the reasons not to choose an alternative can be twofold: either the speaker knows that the alternative is not true, or at least he does not know whether it is true, or has no evidence for it. Or asserting the alternative would be less informative, since it is entailed by the foreground anyway. As long as there is evidence for the truth of a proposition, one always has to go for the stronger. This type of reason (for not to use  $F'$ ) relates to Grice’s maxim of Quantity, whereas the other one relates to the maxim of Quality.

When scales are involved, what happens is that we know which element yields a stronger and which a weaker proposition. Weaker ones are ruled out for the reason which has to do with informativity. Stronger ones give rise to scalar implicatures, in particular they are taken to be false. This has the status of an inference which is to be drawn on the basis of the fact that the stronger element from the set of alternatives has not been used.

For scalar contexts Krifka proposes a special operator, Scal.Assert', with an equivalent meaning to normal assertion, but an additional triggering condition, which states that the proposition actually asserted and the alternative propositions are informationally ordered with respect to each other. Its semantic impact is that all propositions that are semantically stronger than the proposition actually asserted are in fact taken to be false, hence negated. Let me cite the detailed definition here.

- (106) a. Assert' ( $\langle\langle B, F, A \rangle\rangle$ )(c) = Scal.Assert' ( $\langle\langle B, F, A \rangle\rangle$ )(c),  
 if for all  $F' \in A$ :  $[c \cap B(F')] \subseteq [c \cap B(F)]$  or  $[c \cap B(F)] \subseteq [c \cap B(F')]$
- b. Scal.Assert' ( $\langle\langle B, F, A \rangle\rangle$ )(c) =  
 $\{i \in c \mid i \in B(F) \wedge \neg \exists F' \in A [[c \cap B(F')] \subset [c \cap B(F)] \wedge i \in B(F')]\}$
- [Krifka 1995, ex. 31]

The triggering condition in (106a) demands an ordering of the resulting propositions in terms of strength, and the clause in (106b) states that there must be no alternatives, which give rise to stronger propositions when the background B is applied to them and which are true with respect to the world index. Krifka makes one remarkable comment to this definition and I do not want to leave it unquoted: “*In a more refined semantic theory the second conjunct in this set would have the status of a conversational implicature.*” [Krifka 1995:12]

Scalar assertion applied to our examples with NPIs in a positive statement give rise to a contradiction. I spare the formal derivation here, rather I give a verbal description. Given that *thing'* expresses the most general property, it constitutes the weakest member of a scale, since any potential alternative (and *Assert'* demands that there be alternatives compatible with the context *c*) entails the most general property *thing'*. (The set of alternatives is defined in exactly that way:  $\{P|P\sqsubset\textit{thing}'\}$ .) Krifka argues that the first and the second conjunct of the *Scal.Assert'* rule now contradict each other: The first conjunct states that *Mary saw a thing'*, and the second one demands that there is no alternative element  $P|P\sqsubset\textit{thing}'$  giving rise to a stronger proposition, such that *Mary saw a P*. “*Whenever Mary saw some  $x$  that is a **thing**,  $x$  will fall at least under some property  $P$  that is defined more narrowly. Technically, every input common ground  $c$  will be reduced to the empty set. [...] A sentence like (103a) [orig. (26)] is not simply bad because it would express a very general meaning. [...] Rather, (103a) is bad because it expresses a sentence in which what is said systematically contradicts what is implicated. The assertion made by (103a) says that Mary saw something, but the implicatures deny that Mary saw anything in particular.*” [Krifka 1995:13] The last remark is a response to criticisms by Kadmon&Landman. However, I am not absolutely sure whether the formulation presented really explains what is going on. In a naïve conception we could imagine a statement that *Mary saw something* not to be specified in any further way. Any alternative would impose some specification, which would render the statement false on its implicatures, hence there is no such alternative. In positive contexts these alternatives would automatically entail the most general property expressed by *anything*, however, if there is none, why should we care? I think the crucial point is that under such circumstances the assertion by itself is undefined, since we have an existence requirement on assertable alternative propositions (105b). In principle, we could circumvent this problem with weaker propositions without violating the second conjunct of *Scal.Assert'*. However, under normal circumstances the definition of *anything* tells us that this work-around must fail, since *thing'* refers to the weakest member of the scale. This kind of reasoning perhaps goes beyond the intentions of Krifka’s argumentation. Anyway, K&L’s criticism appears to be not justified. In my view the ungrammaticality of ‘unlicensed’ *any* follows directly from Krifka’s pragmatic/semantic analysis of assertions in general. This also will give us some more freedom to



tackle the most difficult case where *any* can occur in a context apparently devoid of any licenser: sub triggering, which will be dealt with in chapter 3.

In negative contexts such as (103b), life is much easier. The first conjunct of the Scal.Assert' rule restricts the common ground *c* to those worlds *i* for which Mary did not see a thing'. And the second conjunct is trivially satisfied, because now thing' triggers the strongest proposition, so there is no  $P|P \subset \text{thing}'$  such that the proposition 'Mary didn't see P' is stronger than 'Mary didn't see thing'. As for the condition on assertions, we are free to use any alternative property P to satisfy the existence requirement on alternatives; they come for free and they are even entailed by thing'. This correlates also quite naturally with the Exhaustivity Requirement imposed on weak NPIs. Now let us turn on to strong NPIs.

### 1.3.3.2 Strong NPIs: focussed any

Stress makes a difference. Consider the following two examples, where in the second one *any* is stressed, and optionally re-enforced by *at all*.

- (107) a. Mary didn't get anything for her birthday.  
 b. Mary didn't get ANYthing (at ALL) for her birthday. [Krifka 1995, ex. 35,36]

While (107a) conveys the simple statement that Mary got nothing for her birthday, in the second there is some additional stress on the fact that Mary didn't even get some minor, irrelevant present for her birthday. Krifka refers to Kadmon&Landman's observation that in the relevant cases there is widening of the extension of the noun meaning to include – as he puts it – borderline cases. K&L's analysis will be presented in detail in chapter 3. Let me just mention the crucial difference to Krifka's proposal: while they take widening as a general property of *any* and treat stressed and unstressed *any* on a par, Krifka makes explicit reference to stress and can therefore explain some important differences between weak and strong NPIs with respect to their licensing properties

The meaning of *ANYthing* as opposed to previously discussed *anything* involves explicit exclusion of borderline cases for the set of alternatives. Krifka employs a second order predicate 'min', which refers to "minor" entities of a certain dimension. Notably, this predicate is used only preliminarily and can be given a derived meaning in terms of criteria of applicability. The tri-partite structure expressing the meaning of *ANYthing* would look as follows:

- (108) *ANYthing*:  $\langle B, \text{thing}', \{P|P \subset \text{thing}' \wedge \neg \text{min}(P)\} \rangle$  [Krifka 1995, ex. 37]

Regarding the set of alternatives, it is important to mention that in Krifka's terms the set is non-exhaustive. This follows from the fact that the property thing' can be applied to minor object to which no predicate P can be applied.

- (109) Non-exhaustivity requirement:  $\cup \{P | P \subset \text{thing}' \wedge \neg \text{min}(P)\} \subset \text{thing}'$   
 [Krifka 1995, ex. 38]

Not directly tied to, but corroborated by this requirement for non-exhaustivity is the fact that strong NPIs are used with a different type of assertion. Krifka proposes another kind of operator: *Emph.Assert'* which comes with a presupposition of likelihood relative to a given context:  $<_c$ . This can be expressed by an overt focus marker like *even*. (Cf. Horn&Lee (1996), who exactly exploit the possibility to assume a covert *even* in order to introduce the relevant meaning). Or it can be imported by Fauconnier's "quantificational superlatives", or just inferred from the context.

- (110) a. Mary knows every place on earth. She has (even) been to BORneo.  
 b. John would distrust Albert SCHWEITZER. [Krifka 1995, ex. 39a,c]

The item under emphatic stress is taken to be the least likely one among the whole set of alternatives. Krifka's rule for emphatic assertions captures this fact with two clauses: the meaning of the proposition with the foreground must be less likely than any of the propositions with the elements of the alternatives and also less likely than the conjunction of all alternatives, relative to the given common ground.

- (111) *Emph.Assert'* ( $\langle B, F, A \rangle$ )(c) =  $c \cap B(F)$ , iff  
 (a) for all  $F' \in A$ :  $c \cap B(F) <_c c \cap B(F')$   
 (b)  $c \cap B(F) <_c \cap \{c \cap B(F') \mid F' \in A\}$  [Krifka 1995, ex. 40]

The probability/likelihood relation  $<_c$  is related to semantic strength: if two propositions  $p$  and  $q$  are of equal semantic strength, but ordered by probability ( $p <_c q$ ), then the less likely one also entails the other asymmetrically ( $p \subset q$ ). Hence it is possible to build in semantic strength into *Emph.Assert'* by replacing the likelihood relation with entailment.

The conditions in (111) with the entailment relation instead of probability (which are to be taken as felicity conditions), tell us that the proposition with the element in focus must be stronger than the background applied to each of the alternatives and the conjunction thereof. The difference to the definition of *Scal.Assert'* is that with the latter we had a ban on alternatives that would yield stronger propositions than the item in the foreground, while now there is a demand for being stronger than any alternative. The reasoning why strong NPIs are excluded from simple positive statements is similar to some extent: applying *Emph.Assert'* to the proposed  $\langle B, F, A \rangle$  structure yields a contradiction. Condition (a) of (111) says that for all alternatives  $P$  in a sentence like "Mary got ANYthing", with the proviso that they exclude minor/irrelevant extensions, the proposition that Mary got a thing' should be stronger (by being less likely) than the proposition that

Mary got P. This is not supported by the regular upward entailing context and plainly contradicts the definition of P, which is:  $P \sqsubset \text{thing}'$ . Here we cannot argue that the assertion would not be defined, because there are no assertable alternatives left (exploiting exhaustiveness). The relevant alternatives are clearly there, and necessarily distinct from  $\text{thing}'$ , but now we produce a contradiction which cannot be circumvented in any way.

Weak NPIs are excluded from emphatic contexts by virtue of their exhaustiveness. Remember that this requirement stated that the union of all alternatives is equivalent to the meaning of the item in question. Emphatic assertion, however, demands that the meaning of the foreground item must be stronger than any of the alternatives but also stronger than the union of alternatives, given a certain context and relative to the common ground. So, NPIs of the weak type appear to be “not extreme enough”, hence they are ruled out from emphatic assertions. This is important, since strong NPIs are not always detectable by focus, but still they require the rule of emphatic assertion. Krifka himself is a bit uncertain how to motivate the latter correlation, and alludes to Grice’s maxim of relevance: if a speaker uses an “extreme” expression of the type of strong NPIs, then the speaker should make appropriate use of this feature.

Really interesting is his attempt to relate the differences between strong and weak NPIs with respect to their licensing environments. Zwarts (1990/93, 1998) proposed as an empirical generalisation that weak NPIs must live in a DE-environment, whereas strong NPIs demand a stronger licensing domain: anti-additivity. The difference can be experienced when embedding strong NPIs under expressions like ‘fewer than n N’ as opposed to ‘no N’.

- (112) a. ??Fewer than three students {lifted a finger/read any book at all}<sup>32</sup>  
 b. No student {lifted a finger/read any book at all}

Krifka offers an interesting solution. He suggests that emphatic assertions are emphatic ‘across the board’, meaning that whenever there are expressions related to alternatives in an emphatic assertion, the meaning of those expressions has to be ‘extreme’ with respect to the alternatives. Suppose that downward-entailing quantifiers like ‘fewer than n’ or ‘no’ also come with alternatives ordered along a scale of quantity. Then *no* would clearly mark the extreme value. Krifka notes that “*we should assume that no can occur easily in emphatic assertions with another strong NPI, whereas fewer than three should be resistant.*” I will elaborate on that idea in connection with Chierchia’s implementation of

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<sup>32</sup> Krifka gives a ‘\*’ as the judgement of grammaticality (for analogous examples), while admitting that “[...] Zwarts’ observations seem to be tendencies rather than strictly grammatical facts, we perhaps even do not want to rule out combinations like fewer than three girls did anything at all by fundamental principles.” [Krifka 1995:18].

the apparent ‘roofing constraint’ on NPI licensing in the next chapter. Krifka raises to empirical arguments that can be taken to support this idea. First, it is interesting that in a context where *no N* licenses a strong NPI, that very phrase is preferably also read with strong, emphatic stress. And second, that strong NPIs are fine with (stressed) licensors modified by items that ‘tone down’ their extremity in a broad sense, resulting in a loss of anti-additivity, while preserving the extremity with respect to their alternatives.

(113) NO friend of mine lifted a FINGER / did ANYthing at ALL. [Krifka 1995, ex. 45]

(114) a. Hardly ANYONE lifted a FINGER to help me.  
 b. Practically NOONE lifted a FINGER to help me. [Krifka 1995, ex. 46]

There are certain other NPIs discussed by Krifka, worthwhile to look into detail, although they fall in either of the classes weak or strong NPIs. What is interesting with them is how the particular meaning properties can be reconstructed from different sources of evident. In the following section I will present NPIs as expressions of general nature (of which any can be seen as the most prominent member), expressions that relax criteria of applicability, such as *at all*, *much of a*, or *in the least*, referentially non-specific expressions like *ever*, and expressions that refer to minimum entities.

### 1.3.3.3 Subtypes of polarity items

The analysis described so far has been exemplified with *anything*, which in its unstressed variant comes along with an exhaustiveness requirement. Under stress/emphasis/focus this requirement is turned into a requirement on non-exhaustiveness. Intuitively, this seems quite natural, since (emphatic) focus demands a directly accessible set of alternatives distinct from the item in focus, whereas without emphasis, the exhaustiveness results from the fact that the noun modified by *any* denotes the most general property corresponding to 'thing' which may be the grammaticalisation of an abstract feature for non-animacy.

English grammar permits *any* to occur with almost any common noun, and its function is to highlight the denotation of the most general property associated with the meaning of that noun. There are also several grammaticalised variants like *anybody* or *anywhere*, all of them functioning the same way.

In addition, there are certain idiomatic NPIs that also express concepts of a general nature, like (stressed) *sound* or *thing*.

- (115) a. John didn't hear a SOUND. (A = {P|P⊆sound' ∧ ¬min(P)})  
 b. John didn't eat a THING. (A = {P|P⊆edible.thing' ∧ ¬min(P)})<sup>33</sup>  
 [Krifka 1995, ex. 48]

Both of these NPs in their idiomaticised meaning express most general properties. The source of grammaticalisation maybe lies in the fact that the nouns under discussion express very general properties from the start, so it would be counter-intuitive to expect this grammaticalisation process with more specific common nouns, like “John didn't hear a shriek.” Krifka observes that these items are obligatorily focussed, hence behaving like other strong NPIs (which can be seen in the paraphrases “*any sound at all*” or “*anything at all*”). One reason I can think of why these items are always strong might be that they only get conventionally associated with alternatives, hence these alternatives must remain fully accessible and an exhaustive meaning of the items in questions is precluded.

We have seen before that *any* can be turned into the strong variant by adding of, or reinforcing with the expression *at all*. This expression has several kins, *much of a*, or *in the least*, all of which express a most liberal interpretation of the expressions in their scope. Consider the following examples:

- (116) a. Mary isn't much of a clarinettist.  
 b. \*Mary is much of a clarinettist. [Krifka 1995, ex. 49]
- (117) a. John isn't tired at all.  
 b. \*John is tired at all. [Krifka 1995, ex. 50]

Vague predicates may have different criteria on how strict they are to be interpreted, or at least there may be different reasons or evidence for the application of a predicate, such as ‘*being pregnant*’, which must be seen as rather non-vague. Expressions like *at all* signal that the phrase in their scope is to be interpreted in the most liberal way, or requiring the least evidence, and they come along with a set of alternatives with a meaning interpreted in stricter ways or requiring greater evidence. Krifka introduces a relation expressing the strictness of the standard of applicability, which applied to predicates translates into semantic strength, as we have already seen it with the relation of probability/likelihood. I will not give the exact semantic representation for the item *at all*, let it be enough to describe its properties: the foreground of a predicate modified by *at all* is the property that holds of all the individuals that fulfil the denotation of the predicate under some precision standard *j*. The idea of using “precision standards” or “standards of evidence” goes back to

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<sup>33</sup> Edible.thing' is a somewhat abbreviated short form for the most general property fulfilled by every contextually relevant object, specified by the sortal restrictions imposed by the verbal predicate.

Lewis (1970) proposal for degree adjectives. Krifka further assumes that “*the alternatives are the meanings of tired* [the predicate Krifka uses to exemplify the semantics of *at all*] *under some precision standard that is not the minimal one for tired. Under this construction, the foreground is weaker than every alternative.*” [Krifka 1995:20].

It is hard to tell, which property of an item triggers the overall behavior, and which properties are to be deduced from more general principles reacting to the triggering property. Krifka suggests that the meaning of an item like *at all*, which involves a precision standard as a threshold of relevance, indicates that the predicate in discussion must be interpreted with a standard below this threshold. From that one can reconstruct that the set of alternatives must be non-exhaustive, hence *at all* is rendered as a strong NPI. I assume that this analysis is correct. Notice, however, that some of these items (*at all, in the least*) by themselves seem to indicate endpoints of a scale, in their original conception this may be the low or the highest one. *In the least* most plausibly refers to the lowest precision standard, whereas with *at all* we would have to reconstruct the actual meaning via an implicit exhaustiveness, which in its actual use is overridden by the requirement that the set of alternatives does not include the minimal precision standard itself. One last remark to those items concerns the compositionality. When combined with a phrase modified by *any*, we automatically get the strong NPI interpretation for *any*. This is due to the fact that once emphasis is introduced, it has to be used for all items in question. In particular, the phrase with *any* will be interpreted relative to precision standards introduced by *at all*, for example. Krifka notes that “*the alternatives are properties P' that are subproperties of thing'* [in the case of ‘anything at all’] *and that are interpreted at some non-minimal precision standard. This should substitute the preliminary representation that was using a special predicate ‘min’.*” [Krifka 1995:21]. Deducing non-exhaustiveness from standards of applicability via the non-minimality requirement on alternatives results in an analysis that resembles very much Kadmon&Landman’s analysis for *any* to be discussed in chapter 3. However, where they misleadingly do not and cannot make the difference between strong (stressed) *any* and weak *any*, Krifka implements this difference at the basis of his analysis. Furthermore, everything follows from the semantic properties of the respective NPIs plus the formal rules for various kinds of assertions. In addition, Krifka’s proposal covers a wide array of different items, whereas K&L focus solely on *any*. Still, as we will see, they discuss a very wide range of licensing contexts.

One item that Krifka discusses is *ever*, which he labels a referentially non-specific expression. He assumes that the meaning of *ever* can be characterised as suppressing reference to specific times. Supporting evidence for this fact is that *ever* is inappropriate with temporal adverbials specifying reference time, even though *ever* is in the local scope of negation.

- (118) When I left home yesterday, I didn't (\*ever) close the windows.  
[Krifka 1995, ex. 57]

Assuming that specific *when*-clauses introduce a reference time that is to be picked up by the main clause and combined with the characterization of *ever* to block such temporal interpretation (with a specific reference time) explains why this sentence is not acceptable. The semantic analysis involves reference to times in combination with reference to worlds, such that the index  $i$  can be conceived as a pair  $\langle w, t \rangle$ , where  $t$  refers to a time interval. The temporal clause in (118) involves a relation  $at'$  between a time interval  $t'$ , a proposition  $p$  and the index  $i = \langle w, t \rangle$ , which returns true iff  $t'$  satisfies the proposition at  $\langle w, t \rangle$ . Notice that the time parameter has to be interpreted specific, so it will be bound by a  $\iota$ -operator. Krifka further assumes that *ever* existentially binds the time parameter, and also introduces alternatives, a set of propositions for which the time parameter is set to some value or other. Treating *ever* as a proposition modifier gives the following semantic representation, a tripartite structure similar to the ones we have already seen:

- (119)  $\langle \lambda X.X, \lambda p \lambda \langle w, t \rangle \exists t' [p(\langle w, t' \rangle)], \{ \lambda p \lambda \langle w, t \rangle [p(\langle w, t' \rangle)] \mid t' \in T \} \rangle$   
where  $T$  is the set of contextually relevant times. [Krifka 1995, ex. 60]

$T$  is the set of all the times the existential quantifier in the foreground can range over. Since  $T$  contains all the times, the meaning of *ever* must be exhaustive, just like unstressed *any*, yielding a weak NPI.

- (120)  $\{ \langle w, t \rangle \mid \exists t' [p(\langle w, t' \rangle)] \} = \cup \{ \{ \langle w, t \rangle \mid [p(\langle w, t' \rangle)] \} \mid t' \in T \}$   
[Krifka 1995:23]

The difference to *any* is that here we are not dealing with a most general property, but with times, which enter the index  $i$  in the form of  $\langle w, t \rangle$  pairs. The question is, whether it is possible to arrive at a non-exhaustive meaning. This, to my opinion, can only be the case if we apply a standard of precision to whole situations, i.e., world-time pairs. But this is a bit of a problem – how could one evaluate a set of situations in terms of precision? I will pick up that matter in chapter 3 in connection with K&L's observation that some non-adversative predicates license stressed NPIs provided the context allows for a strengthening of non-exhaustive quantifiers.

The reasoning, why *ever* behaves just like any other weak NPI is the same that we had before. Only in an appropriate (DE) context the assertion of a proposition with some time parameter  $t'$  is not weaker than any of the alternatives, but at least equally strong. And in that configuration the conditions on felicitous assertions are met.

Now back to our example (118) – the reason why *ever*, even though licensed, is incompatible with a specific *when*-clause lies in the fact, that the proposition with the

foreground ( $t'$  – existentially bound) entails all other proposition with times from the set of accessible times  $T$ . The *when*-clause on the other hand refers to just a single time, so it cannot match the time(s) made accessible through *ever*. I am not sure whether this is the kind of explanation Krifka aims at, he suggests that the failure lies in the fact that “*the temporal parameter  $t'$  [of the proposition associated with the foreground] cannot be fixed by operators like the adverbial clause [...]*” [Krifka 1995:22]. Note that in principle temporal adverbial clauses are not incompatible with *ever*, as long as they specify a time interval that contains all times accessible to the alternative set associated with *ever*.

- (121) When I lived in the tent, I didn't (ever) close the windows, (because there were none.)

The last group of NPIs Krifka discusses are expressions that refer to minimal (or maximal) entities. In their NPI usage, they receive an idiomatic meaning. The precise semantic formalism is not of our concern here. Just one principle Krifka proposes is important to mention; he calls it the “principle of extremity”. It makes use of the fact that the quantity the NPI refers to is of an idealised small size (e.g., ‘(not) *drink a drop*’), and states that for all natural common grounds  $c$ , “*the proposition that someone drank just a minimal quantity of liquid and not more should always be less probable than that he or she drank a more substantial quantity of liquid*”. [Krifka 1995:24]. Furthermore, these items seem to always bear stress, and they combine quite freely with the focus marker *even*. This indicates that the kind of assertion we are dealing with here is emphatic. When we have one of these items in a positive statement, we arrive at a contradiction, since the proposition with the NPI as foreground is only at most as strong as the proposition with alternative quantities,<sup>34</sup> and given the principle of extremity it is in fact weaker. But emphatic assertion prohibits stronger alternatives. In DE contexts we get the reverse picture, and the NPIs are fine.

The explanation Krifka gives is a bit more complex, given that I left out the formal details, but the argumentation seems clear. However, I doubt that it is necessary to invoke an independent principle to explain or motivate that these NPIs mark extremes. Notice, that the final argument, why the items in question are NPIs depending on a DE context can be achieved solely by applying our mechanism on scalar assertions. The only property of these NPIs that has to be motivated is that they are non-exhaustive, hence strong NPIs occurring in emphatic contexts. Remember that it is important to keep these two things separate, whether an NPI is strong or weak (non-exhaustive or exhaustive) and whether it can or must occur in an emphatic assertion.

There are two points to explain how this effect arises. One is that these NPIs mimic specific quantities, with the proviso that they be minimal. When we believe that

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<sup>34</sup> Quantities have to be regarded as properties of certain objects or sets.



alternatives must be different from the element in foreground, then this should be reason enough to conceive the NPI as non-exhaustive. (In formal terms, using the example of *a drop*:  $\text{drop}' \neq \cup \text{drop}'^A$ , and even  $\text{drop}' \cap \cup \text{drop}'^A = \emptyset$ ) The second argument involves a similar reasoning as we had before with the standard of precision or applicability. Take the idiomatic meaning as expressing a quantity that is minimal in the sense that it must be below any other quantity as a potential alternative. That amounts to claiming that the quantity must be conceived as (almost) zero.<sup>35</sup> Together with the first argument, exclusion of the foreground from the set of alternatives, we get our exclusion of minimal values, hence non-exhaustiveness and a scalar assertion.

Krifka notices that these expressions can express minimal quantities without having the negative polarity property, but having just the interpretation as a minimal quantity. He states that this is confined to ironic or hyperbolic uses. I believe that it is indeed a bit tricky to establish the necessary contexts, but nevertheless the result need not be ironic or exaggerating. Consider the following examples.

- (122) a. Mary drank (only) a drop of that Schnaps and immediately she was drunk.  
 b. He budgeted (only) an inch and the alarm went off.

What happens here is that the minimal quantity becomes relevant. The difference can be highlighted by inserting *only* instead of *even*. The assertions, however, are felicitous, since all the alternatives (which would be stronger than the minimal quantity) are taken to be false, so the condition on emphatic assertions, that there must not be any stronger propositions, is met. I suspect that this is just a very special case and that it will not be possible to construe such examples with apt contexts for all idiomatic NPIs expressing minimal quantity.

Certain idioms use very large quantities instead of minimal ones, which in turn become conventionalised as maxima. The reasoning is the same as before, just with a different direction of associated scales, in other words, a reversed entailment. This is not surprising, since we saw already that scales can be established in either way (cf. Fauconnier 1975ab). Two typical examples are the following, for which I also give German counterparts:

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<sup>35</sup> Manfred Krifka (p.c.) suggested an analogy to  $\varepsilon$  in algebra, which is distinct from zero, but converging towards zero, and which is taken as a minimal measure, too.

- (123) a. Wild horses couldn't drag me there.  
 b. We will not know the truth {in weeks / in a million years}.  
 [Krifka 1995, ex. 68]

- (124) a. Keine zehn Pferde bringen mich dort hin.  
 No ten horses bring me there PRT  
 b. Wir werden die Antwort in hundert Jahren nicht wissen.  
 We will the answer in hundred years not know

The entailment goes as follows: If some specific amount or kind of horses can cause that I will go there, then the maximal amount or the strongest kind of horses will do so anyway. A specific amount / kind yields a semantically stronger proposition than the item actually used, which results in an infelicitous (emphatic) assertion.

Interestingly, some conventionalised maximal quantities come with a different entailment relation. These are some cases of PPIs. Consider the following paradigm:

- (125) a. John has TONS of money.  
 b. %John doesn't have TONS of money. [Krifka 1995, ex. 69]

As always with PPIs, there is the possibility to use the negation in a metalinguistic sense, as a denial of something that has been previously asserted. But here the entailment goes in the reverse direction, due to the highlighting of the inclusion of parts: If John owns some contextually established maximum of money, he also owns some part of it, any specific amount below the maximum will be automatically entailed by the expression that forms the PPI. It takes this not to be a property of the expressions under discussion themselves, but rather as an effect of different modality. Whereas the former always involve possibility, the latter are non-modal statements. I will discuss these effects in greater detail in chapter 3.

Even more interesting are the properties of the modifiers *rather* or *pretty*. These are some classical cases of PPIs (cf. Baker 1971). In a way, it can be regarded as the counterpart of *at all*, and it introduces alternatives that are interpreted more liberal in terms of a standard of precision or applicability. Notice, that in order to be more liberal one has to have a vague predicate from the start.<sup>36</sup> The alternatives to a predicate modified by *rather* are interpretations of the predicate at weaker precision standards. Therefore it is always the case that *rather.P* entails *P'*, any of the alternatives, and moreover, the complex of *rather.P* is exhaustive: e.g., *rather.tired'* =  $\cup$  *rather.tired'<sup>A</sup>*. This may be rather surprising,

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<sup>36</sup> Cf. *\*rather pregnant*. I have the feel that this co-occurrence can be used in contexts, where *being pregnant* is rendered as a vague predicate (to express for example whether or not one can see whether someone is pregnant.) The function of *rather* is to signal vagueness and to indicate that the standard of precision is more liberal.

but it follows from the fact that *rather* does not mark an extreme. The consequence is that *rather* or *pretty* form weak PPIs, which resist any downward entailing / scale reversing context. Notice that while weak NPIs are much more liberal towards licensing contexts, weak PPIs are much stricter.

- (126) a. John is *rather/pretty* tired.  
 b. \*John isn't *rather/pretty* tired. [Krifka 1995, ex. 70]
- (127) a. \*Nobody is *rather/pretty* tired.  
 b. \*Fewer than 3 students are *rather/pretty* tired.

But this higher strictness of the weak PPIs *rather* or *pretty* nicely corresponds to the higher strictness of their strong NPI counterparts like *at all*. In the following, Krifka explicitly excludes *some* from the class of PPIs, because – as he argues – *some* does not introduce alternatives and should therefore not be regarded as a polarity item. I am very grateful for this statement and will discuss more of the properties of *some* in chapter 4. However, he mentions another class of PPIs, which come with a certain type of presupposition: *already* and *still*.

Their status as PPIs was recognized at least as early as Horn (1970) and Baker (1970b). According to Horn, they assert the proposition without the modifying element, but come with a special type of presupposition. Consider the following paradigm, cited from Horn (1970), where A stands for assertion, and P for presupposition:

- (128) a. It is *already* raining / It isn't raining yet  
           P: It will be raining some time later  
           A: It is raining now / It isn't raining now
- b. It is *still* raining / It isn't raining anymore  
           P: It was raining earlier  
           A: It is raining now / It isn't raining now
- c. It will start raining *before* Sunday / It won't start raining until Sunday  
           P: It will be raining on Sunday (It will have started raining by Sunday)  
           A: It will start raining sometime earlier than Sunday / It won't start raining  
               any time earlier than Sunday

In a bit more formal terms, this can be expressed as follows, where  $t_0$  stands for the reference time,  $i$  is an index on the time parameter expressing temporal ordering:

- (129) a. already/yet P:  $(\exists i)(i > 0 \ \& \ t_i(S))$   
 A:  $t_0(S) / \neg t_0(S)$
- b. still/anymore P:  $(\exists i)(i < 0 \ \& \ t_i(S))$   
 A:  $t_0(S) / \neg t_0(S)$
- c. before/until P:  $t_0$   
 A:  $(\exists i)(i < 0 \ \& \ t_i(S)) / \neg(\exists i)(i < 0 \ \& \ t_i(S))$

[Horn 1970]

Or taking Krifka's formal description for *already*, we get (i) the assertion that the proposition holds at  $t$  (corresponding to  $t_0$  in Horn's notation), (ii) a set of alternatives relating to time parameters (later than  $t$ ), and (iii) the presupposition that the proposition changes its truth value from false to true and stays true (within the contextually relevant time).

- (130) a. Mary is already here.
- b. (i)  $\lambda\langle w, t \rangle. \mathbf{Mary.is.here}(\langle w, t \rangle)$   
 (ii)  $\{\lambda\langle w, t \rangle | \mathbf{Mary.is.here}(\langle w, t' \rangle) \mid t < t'\}$   
 (iii) Presupposition:  $\lambda\langle w, t \rangle. \exists t' \forall t'' [ [t' < t' \rightarrow \neg \mathbf{Mary.is.here}(\langle w, t'' \rangle)] \wedge [t' < t'' \rightarrow \mathbf{Mary.is.here}(\langle w, t'' \rangle)] ]$   
 [Krifka 1995, ex. 73]

The presupposition here is a bit more complex than in Horn's schematization. It assumes a time  $t'$ , at which the proposition without *already* becomes true. Each time after that time value must yield true propositions. What is not stated explicitly here (although it is in Horn's account), but what follows from the assertion combined with the presupposition is that the actual reference time must also follow the time  $t'$ , at which the flip-flop takes place (or the event takes place, which leads to the state or achievement evaluated in the proposition.) Taken that the alternatives have a time value that follows the one of the asserted proposition, they will always be true by entailment, hence the foreground proposition is indeed stronger than any of the alternatives. Therefore it falls out quite naturally that the entailment relations must be preserved and must not be reversed, hence the status as a PPI. The other items of this class, *still*, *yet* and *anymore* can be easily integrated into that kind of argumentation.

#### 1.3.3.4 NPIs and locality

There are two types of effects concerned with locality. One goes back to Baker's (1970b) observation that multiple negation, although the specific negative elements may cancel each other out as far as the logical status of the whole sentence is concerned, not necessarily fails to license NPIs. This is what Chierchia (2001) calls the roofing effect:

once a NPI is properly licensed, it remains so regardless what is going on higher in the structure. The second effect has to do with intervention and island constraints. Intervention was first mentioned by Linebarger (1980, 1987) and can be described as a prohibition against certain operators intervening in the structural relation between a licensing element (negation) and an NPI. Island effects were recognised earlier (Fauconnier 1975a,b, Baker 1970, Linebarger 1980, 1987) and can be explained in a similar way as intervention effects (see especially Chierchia's 2001 treatment of intervention effects.)

Let us start with the latter. Consider the following two pairs of sentences, which exemplify the Coordinate Structure Constraint and the Complex Noun Phrase Constraint as formulated in Ross (1967):

- (131) a. Mrs. Crabtree refuses to let her daughter elope with anyone.  
 b. \*Mrs. Crabtree refuses to let her daughter and anyone elope.
- (132) a. I didn't see anyone's husband at the meeting.  
 b. \*I didn't see the man anyone is married to at the meeting.

According to Krifka the reason why sentence (132b) is out is that in the semantic representation the definite NP '*the man*' fails to project the BFA-structure introduced by the NPI. Consider the semantic representation for (132b), which is designed analogous to Krifka's original example:

- (133)  $\langle \lambda Q \lambda i \neg [\text{see}'_i (I, \iota x \exists y [\text{man}'_i (x) \wedge Q_i(y) \wedge \text{married.to}'_i (y,x)])], \text{person}', \{P|P \subset \text{person}'\} \rangle$

In order to strengthen the foreground *person'* to some specific  $P|P \subset \text{person}'$ , the same man would have to be picked again, due to the  $\iota$ -operator binding the variable. This is in case a more specific person  $P$  had married him, which obviously does not lead to strengthening, or the expression is not referring at all. In case a more specific person  $P$  has not married the man, the NP *the man* does not refer at all. In other terms, the  $\iota$ -operator blocks the strengthening necessary for any scalar assertion. Krifka calls this effect a 'projection failure', since the  $\langle B, F, A \rangle$ -structure associated with the NPI must project high enough in order to include the operator that reverses the scalar properties of the proposition.

This effect disappears when the licenser is within the domain of the relative clause, as in the example below. The semantic representation in (134b) therefore cannot be correct.

- (134) a. The student who had not read anything gave impoverished answers.  
 b. Assert'  $\langle \lambda Q \lambda i [\text{gave.impoverished.answers}'_i (\iota x [\text{student}'_i (x) \wedge \neg \exists y [\text{read}'_i (x,y) \wedge Q_i(y)]] )], \text{thing}', \{P|P \subset \text{thing}'\} \rangle$  [Krifka 1995, ex.78,79]

The NPI is obviously licensed within the embedded clause, and the alternatives do not project higher than the relative clause itself. Krifka proposes that assertions can be

introduced locally, and the alternatives introduced by the NPI are exploited by the local illocutionary operators. This operator also neutralises the alternatives, making them unavailable for higher operators. The structure Krifka gives is the following:

- (135) Assert' [The student [Assert' who had not read anything]  
gave impoverished answers] [Krifka 1995, ex. 80]

By introducing this move, it becomes clear that illocutionary operators are part of semantic recursion. Therefore Krifka argues for a dynamic view upon semantic representations, where semantic representations are functions from input information states to output states. I will not go into detail here, just for reasons of completeness let me cite the relevant passage: “[...] *simple assertion is functional application, perhaps with the additional requirement of assertability, i.e. that the asserted sentence is compatible with and not already entailed by the input state* [the two conditions in brackets in the representation below].” [Krifka 1995:29].

- (136)  $\text{Assert}'(p) = \lambda c t c' [c' = p(c) (\wedge c' \neq c \wedge c \neq \emptyset)]$  [Krifka 1995, ex. 81]

This changes also the rules for assertions with respect to the  $\langle B, F, A \rangle$ -structure. For the exact representation of these rules the reader is referred to the original text. What is important is that with this dynamic definition it is possible to introduce illocutionary operators at various points in the structure. These operators impose their conditions only on their local contexts, and furthermore, they handle potential alternatives introduced by certain items in the scope of the operators and make them unavailable for further computation.

This is important to explain why multiple occurrences of DE operators do not necessarily affect the ability to license NPIs. Consider the following two sentences, where the NPI *anything* is licensed by *rarely* or by negation.

- (137) a. Mary rarely eats anything for lunch.  
b. Mary rarely doesn't eat anything for lunch.

The first is unproblematic, we can assume one  $\text{Scal. Assert}'$  operator for the whole proposition, and the conditions on the associated  $\langle B, F, A \rangle$ -structure will be met due to the scale reversing property of *rarely*. In the second sentence, one has to assume two illocutionary operators, the second one will be of the  $\text{Scal. Assert}'$  type, invoked by the NPI *anything*. According to Krifka, *rarely* quantifies over situations, the predicate formed with

the verb also has to provide a situation variable. The overall semantic representation looks as follows.<sup>37</sup>

- (138) a. Mary rarely doesn't eat anything for lunch.  
 b. Assert' ( $\lambda c \{i \in c \mid \text{rarely}' (\{s \mid \text{lunch}_i'(s)\},$   
 $\{s \mid \text{Scal.Assert}' (\langle \lambda Q \lambda c \{i \in c \mid \neg \exists x [\text{eat}_i'(m', x, s) \wedge Q_i(x)]\},$   
 $\text{thing}', \{P \mid P \subset \text{thing}'\} \rangle) \} )$ ) [Krifka 1995, ex. 85]

Matters are a bit more complicated, though. We have seen before that a separate Scal.Assert' operator and local exploitation of NPIs may take place even at the intra-clause level, but this is not always the case. Krifka cites examples from Schmerling (1971), who showed that NPIs are sometimes subject to the flip-flop of polarity with double negation.

- (139) a. \*There was someone who did a thing to help.  
 b. There was no one who did a thing to help.  
 c. \*There was no one who didn't do a thing to help. [Krifka 1995, ex. 75]

While Krifka casts doubt on the grammaticality judgements associated with the last of these sentences, I take this last case as one of the few examples where locality is not so straightforward to grasp. The question always is: when are we allowed or forced to introduce our Scal.Assert' operator, which makes the context, where the NPI is licensed, opaque? I suggest to discuss these matters later on.

A case where one is forced to assume a separate illocutionary operator are non-bridge verbs, where the potential licenser is not in the embedded clause, but higher up in the matrix clause. In these contexts NPIs are not licensed:

- (140) a. Mary didn't think that John had any problems  
 b. \*Mary didn't shout that John had any problems [Krifka 1995, ex. 94]

Krifka proposes that non-bridge verbs like *shout*, which are quotational, automatically introduce an illocutionary operator. In the case at hand, this would be a Scal.Assert' operator with a background that produces illicit (stronger) alternatives. Finally, Krifka incorporates Linebarger's intervention effects in the same way, by assuming that an intervening universal quantifier forces the Scal.Assert' operator associated with an NPI to be inserted lower than the universal quantifier, hence also lower than, and therefore excluding the potential licenser. Notice that this analysis presupposes a structure where

<sup>37</sup> I have added negation to the existential operator of the inner clause, because I take its missing as a typo in the text provided over the internet, whereas I could not check the original publication.

negation has always widest scope, and only the relative scope between the potential intervener and the NPI is relevant.

- (141) Mary didn't show every child any picture.  
 i) \*Not (Every child x (Some picture y (Mary showed y to x)))  
 ii) Not (Some picture y (Every child x (Mary showed y to x)))  
 [Krifka 1995, ex. 96b]

- (142) i) Assert'[Not(every child x (Scal.Assert'[any picture y (Mary showed x to y)))]  
 ii) Scal.Assert'[Not(any picture y (every child x (Assert'[Mary showed x to y])))]  
 [Krifka 1995, ex. 98]

Many facts indicate that NPIs like *any* has rather fixed scope (in contrast to regular indefinites, which may have quite variable scope, leaving clause boundaries etc.) This, however, is not so much of my concern, but leaving out the indefinite altogether, just the scope relations between universal quantifiers and negation point to an analysis where universals may scope over negation, and this is in fact the only way to get a reading where the universal has scope over negation. (This may be accompanied with a special prosodic contour, though.)

- (143) Mary didn't read every book.  
 i) Not (Every book x (Mary read x))  $\neg > \forall$   
 ii) (Every book x (not (Mary showed y to x)))  $\forall > \neg$

This argument can be enforced by the common observation that LF-movement of strong quantifiers like the universal *every* is strictly clause-bound. In a context where the licenser is extra-clausal, but still a universal intervenes, we expect no reading to exist, where the NPI should be grammatical. This seems to be the case.

- (144) \*I doubt that Mary showed every child any picture.

It is worth noting that this criticism does not affect Krifka's proposal at all. Only when the universal (or whatever intervening operator) can scope over the licenser (negation in our case), we can get a reading where the NPI yields a grammatical interpretation, since its (scale reversing) licenser is within the scope of a Scal.Assert' operator (scalarity induced by the NPI). And the higher structure will find itself within the scope of a secondary Assert' operator.



### 1.3.3.5 NPIs in questions

In the last section of his paper Krifka addresses the problem that weak NPIs are generally compatible with information questions, whereas strong NPIs are used to convey rhetorical questions with a bias towards a negative answer. This observation goes back to Borkin (1971) and has been reformulated in Heim (1984). A variety of accounts on NPIs dealing with questions as licensing environments emphasises the negative bias (Ladusaw 1979, Fauconnier 1980, Linebarger 1980, 1987, Han & Siegel 1996), which may explain the occurrence of strong NPIs. But the fact that weak NPIs like unstressed *any* or *ever* lead to unbiased information questions (as pointed out as early as R. Lakoff 1969) is left unaccounted for in these proposals.

Much depends upon a proper semantics of questions, however, Krifka starts with developing the pragmatic impact of a question. Analogous to assertions, there is an operator Quest' which imposes conditions on potential alternatives:

$$(145) \text{ Quest}' (\langle B, F, A \rangle)(c) = \text{Quest}' (B(F))(c),$$

where for every alternative  $F'$ ,  $F' \in A$  the speaker has reasons not to base the question on  $F'$ , i.e., not to propose that is, to propose  $\text{Quest}' (B(F))(c)$ . [Krifka 1995, ex. 102]

The function of a question is not to update the common ground with a new proposition, but – much in the spirit of Goenendijk & Stokhof (1984) – to introduce a partition on the set of indices, whereas the cells of the partition correspond to propositions which are full answers to the question. In a dynamic theory, a question maps an input state to a set of states (the potential updates of the common ground with possible answers), whereas the corresponding answer picks out one (or more) elements of that set and eliminates the others. (We feel a close connection to the semantics of focus, again.) The next example illustrates this schema of questions/(appropriate) answers with the simplest form of questions, Yes/No-questions. Krifka assumes a special type of illocutionary question operator, as well as a special type of answer assertion operator.

$$(146) \text{ a. YN.Quest}' (p)(c) = \{c \cap p, c - p\}$$

$$\text{b. Answ.Assert} (p)(C) = \cup \{c \cap p \mid c \in C\}, \text{ if } \exists q [q \in C \wedge q \cap p = \emptyset]$$

[Krifka 1995, ex. 103]

The set of propositions constituting the meaning of the question are updates of the common ground with the proposition or its complement (negation). In a bit more dynamic formulation the set corresponding to the question consists of two output common grounds, one where  $p$  holds and one where it doesn't hold. An appropriate answer thus eliminates at least one possibility, i.e., one member of the set of output common grounds. The

information conveyed by the answer is the union of all states in C that are not eliminated, updated with p.<sup>38</sup> This explains, why an answer like ‘*Grass is green*’ to a question like ‘*Is it raining?*’ is taken to be inappropriate, since it does not eliminate either of the two members of the set of common grounds, one in which it is raining, and one in which it is not (very queer, and purely pragmatic inferences precluded).

Now let us come back to the reasons, why the speaker proposes the question with F as the foreground, and rejects the questions formed by applying the background to any of the members of the alternative set. (Remember that the set of alternatives is introduced due to focus, or scalar items such as NPIs). Let me cite the original text: “*In information questions, the speaker intends to construct the question in such a way that every suggested answer would roughly yield the same amount of information increase. [...] A question like (100.a) [=‘Have you ever been to China’] indicates that the speaker has a reason to prefer the more general question over any alternative, presumably because his information state is such that he expects a better overall information gain from an answer to the more general question.*” [Krifka 1995:35] Reconsider the meaning of *ever*: it blocks any specific reference to a certain time. When inserting *ever* into the question we guarantee an absolute equilibrium between the informational values of the positive and the negative answers, since both should have the same probability.<sup>39</sup>

In rhetorical questions, the picture is different. “... *the speaker tries to lower the threshold for a positive answer, showing that he is certain that the answer would be negative.*” [Krifka 1995:34] Using an NPI in a question leads to the strength relation that all propositions with members of the alternative set are stronger than the proposition with the element in foreground (B(F)). There are two options, why a speaker should do that. Either the speaker is convinced that the answer will be negative, that (s)he maximises the *a priori* probability for a positive answer (by establishing a situation where the positive answer would be minimally informative). This comes about because the proposition with the element in focus is a superset of all propositions with alternatives.

Or the speaker assumes, and suggests that alternative answers are incompatible with the common ground. When it is already established that x did not anything substantial to help, the question ‘*Did x lift a finger to help*’ can only ask whether x did something minimal (below the threshold of relevance/applicability) to help, since this is the only thing left to ask. In the context of questions, both options, to my opinion, give rise to the same

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<sup>38</sup> Without extra mention I took over Krifka’s text as close as possible. I found it misleading at first sight that p shows up in both, the question and the answer. But it is clear, that they do not refer to the same proposition, in fact, if the answer is negative, p of the answer would correspond to  $\neg p$  in the question. This potential misunderstanding arises because Krifka, for reasons of exposition, gives a static definition for a semantics which is to be understood dynamically.

<sup>39</sup> Cf. van Rooy (2002) for a very similar account of NPIs in questions.

effect, in particular that the question has to be understood rhetorically with a negative bias, but I agree that it is important to discern the two cases.

#### 1.4. Summary and outline

The last major section was dedicated to Krifka's analysis of NPIs in terms of a pragmatically enriched semantics. I have tried to present this proposal as much as possible in detail since I am quite convinced that in its consequences it is one of the most exhaustive analyses in the literature, and it provides us with principally all ingredients we need for a theory about NPIs that cover all the relevant empirical domains.

Let us recapitulate what we have gained so far and also sketch out remaining problems to be solved (if possible) and tasks to be achieved in the following chapters.

In early accounts such as Klima (1964) we have seen that a certain class of grammatical items is sensitive to a notion of 'affectiveness'. The primary proponent of this class was the indefinite *any* in English and the relevant sensitivity was expressed as a kind of licensing condition such that the item in question must be in a certain structural relationship ('in construction with') with the affective licenser. Klima himself did not cover other cases of NPIs, neither did he talk about licensing, but rather he proposed a set of rules governing the lexical spell out of the two items *any* and *some*. Interestingly, he did not propose a feature for what was later on labeled as NPIs, but only a feature for licensers, affectiveness, which in his terms is a grammatico-semantic feature, while proposing a syntactic analysis. While the achievements of his work are still valid, it turned out that certain derivative claims (not due to Klima) cannot be maintained for the following reasons: a) the class of NPIs is richer, but not uniform, b) *any* and *some* are not necessarily in complementary distribution, c) a purely syntactic view on NPIs does not bring us any further, and also leaves unexplainable a variety of phenomena.

Soon it was clear that the structural relationship between NPIs and licensers has to be viewed as semantic scope, rather than a property of syntactic structural relations. Notice that in contemporary minimalist terms this is a very welcome result, since syntactic structures are taken to be free of (purely) semantic properties, they serve as the input to semantic computation via the LF interface, but they do not handle semantic properties per se.

The *any/some* dichotomy was backgrounded rather quickly, which might be a reason why it keeps popping up, especially when *any* is to be treated as a mere indefinite-plus (see for example Chierchia 2001, and less explicit 2004). The only two works to my knowledge explicitly refuting an apparent parallelism between *any* and *some* are R. Lakoff's (1969) paper against an "*any-some* rule" and Krifka (1995) who denies *some* the status of a polarity item. (This is not to say that other authors haven't acknowledged the fact that *any*

and *some* are not in a strict paradigmatic relationship.) And finally, much work has been put into the investigation of different types of polarity items.

Theoretically, attempts were made to bring together the semantic properties of NPIs and their ‘affective’ licensors, with pragmatic properties. Three names are necessary to mention: Fauconnier’s (1975a,b, 1979) finding that pragmatic scales (with specific entailment relations), scale reversal by certain operators and NPIs have too much in common to be a mere accident. Ladusaw (1979, 1980, 1983), who defined scale reversal semantically as downward entailing, thus providing a formal semantic foundation to a stipulative, although intuitively clear description of pragmatically relevant effects. And finally Horn (from 1969 until now), who always followed a parallel trail, while explicitly stressing the relevance of implicatures and alluding to a parallelism with focus.

If it were not for the discovery of essential empirical facts and important generalisations upon them, Linebarger’s (1980, 1987) work would not have to be emphasized in such a way. Quite in the spirit of the 80ies, she attempted to push back the complex of NPI licensing into the realm of syntax, while refuting the semantic impact and re-introducing pragmatics in a not really motivated, but interesting way. Her major claim is that core licensing is applicable only by negation proper. (This, I think in retrospect, was the only way to argue for NPIs as a phenomenon to be treated syntactically, since only negation can be detected as an item syntactically manifest. Scalar implicatures and a disparate array of operators and other grammatical elements reversing the entailment relation on the associated scales are hard to integrate into a purely syntactic setup.) While tempting, this move had the price that also a mechanism of indirect licensing by negative implicatures had to be introduced. It has to be admitted that in her system a wider range of empirical data could be integrated, but first, there is an unrecoverable lack of explanatory power, and second, NPIs necessarily have to be treated as a uniform class, with no way out. However, it is due to her work that a certain type of locality is now an integral part of any theory on NPIs: intervention effects. And secondly she showed impressively that a simplistic semantic view on NPI licensing fails very quickly – as soon as pragmatic contexts have to be factored in.

The question is, what is the role that pragmatics takes in NPI licensing, and how should we define this role in an overall theory of grammar. Treating pragmatics as an extra-grammatical device (in the sense that it builds upon the meaning of an utterance composed by rules of semantic computation and adds its own, independent constraints in order to embed this meaning into a contextually determined act of communication) will not let us to achieve our goal – we have to integrate the relevant mechanisms into a (perhaps necessarily dynamic) model of semantics. A fruitful analogy is what can be circumscribed as information structure, especially focus. While it is obvious that focus has a driving function in the representation of an active, dynamic discourse, there are convincing

proposals to integrate a theory about focus into a formal semantic theory (cf. Rooth 1985, 1992, Jacobs 1984, von Stechow 1990, 1991). Moreover we can perceive a variety of effects in connection with focus also in syntax proper, at least in certain languages, e.g. Hungarian with a syntactically designated position for constituents bearing focus.

The first step of an integration of pragmatics into a formal semantic theory (at least in the context of NPIs) was undertaken by Kadmon & Landman (1993, to be discussed in chapter 2), where they argue that the semantic contribution of *any* is domain widening (relative to a contextually salient domain of reference) in connection with a strengthening of the assertion. Chierchia (2001/04, 2004) builds upon the notion of domain widening and introduces an algorithm for computing scalar implicatures locally. This means that one can no longer take these implicatures as being part of a global contextual/pragmatic meaning to be processed after semantic computation, but one has to view these implicatures as an integral part of semantic computation (which in turn gets a dynamic characteristics). The second source of Chierchia's recent proposal is Krifka's (1990, 1992, 1995) analysis, although not all influences are reflected explicitly. What is essential in Krifka's account is that he gives a formal definition of assertion (and other illocutionary functions such as questions), which integrate pragmatically motivated conditions into a semantic formalism. In particular, items like NPIs introduce triples of a background, a foreground and additionally a set of alternatives, which are applied to a given context. Empirical data showing that locality plays a very crucial role suggest that these illocutionary operators can, and sometimes must be inserted within the semantic structure of a given sentence/utterance. Local insertion of such operators automatically leads to a dynamic view on the semantic formalism. Another notion introduced and discussed by Krifka is exhaustiveness. This notion enables us to formally discern between 'weak' and 'strong' NPIs with respect to their different licensing properties, while not being forced to stipulate these properties.

It is at this point where I have to posit an apology towards the Dutch research tradition on NPIs, since it has to be acknowledged that without their work (Hoeksema 1983, 1986, 1994, 2002; Giannakidou 1997; van der Wouden 1994a, 1997; Zwarts 1990/93, 1997) our understanding of the phenomenon would be far beyond where we are now. Especially the formal distinction between certain classes of NPIs and the integration of this distinction into a formal semantic theory is due to their school of thought, as well as the extension of the weak/strong distinction in order to include items connected with the notion of 'veridicality' as described in Zwarts (1995) and elaborated upon by Giannakidou (1997 and subsequent work). It was just for reasons of exposition that I have chosen to apparently neglect their work in this introductory section.

Chapter 2 is dedicated to the weak forms of *any* and *ever*. For a better understanding of weak NPIs it is necessary to present the ideas of Kadmon & Landman (1993) already

mentioned at various occasions, who give an account for *any* as an indefinite, as opposed to works that go back to Vendler's (1967) proposal to place *any* among other universals. The discussion on the status of *any* is very insightful, therefore I will also present in detail Horn's (2000a) survey on that matter, as well as Dayal's (1998) (partly) unified analysis for *any* while stressing, again, its universal character. The whole discussion is kept alive by a series of facts that pose problems to either type of analysis: the ambivalency (and sometimes ambiguity) between a NPI and a free-choice interpretation, sub-triggering (where we apparently miss a licenser), and (rarely acknowledged<sup>40</sup>) comparatives, where such NPIs show up neither as free-choice, nor generics, but still they receive a universal interpretation in some sense. In the end we will have to reconsider the notion of quantifiers within syntactic and semantic structure, but after doing so it will be possible to better justify the notion 'exhaustive indefinite'.

In chapter 3 I will elaborate on an analysis for strong NPIs, as described in section 1.2 and along the lines already indicated above. It will turn out that Chierchia's (2001) proposal also fits perfectly to the behavior of 'strong NPIs', but certain caveats have to be introduced when analysing 'weak' *any*. Also of great relevance is Lee & Horn's (1994) work on the contribution of the focus marker '*even*' in connection with strong NPIs. In a language like German, most of the strong NPIs have to be accompanied explicitly with the complex focus marker '*auch nur*', and I will try to formalise the properties of such markers in connection with the scalar behavior of NPIs.

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<sup>40</sup> But see Schwarzschild & Wilkinson (2002).

## 2. Weak NPIs and alternatives

From the discussion so far it seems clear that the licensing contexts of strong NPIs form a proper subset of the contexts where *any* is appropriate. In other words, whenever a strong NPI is appropriate, *any* or *ever* will be licensed, too. In this chapter, I will defend four (anti-)theses regarding NPIs like *any*, arguing against certain assumptions sometimes found in the literature.

First, NPIs do not have uniform properties, they do not form a unified class of grammatical items. The idea, that licensing conditions form proper subsets (cf. Zwarts 1990, 1996; Giannakidou 1997) does not affect this claim. I will show that the intrinsic properties of strong NPIs and indefinites like *any* are rather different.

Second, deriving from the first, there is no grammatical, syntactically relevant feature expressing polarity (cf. Postal 2000, Szabolcsi 2004). Hence, polarity licensing does not involve overt, covert, or feature movement (cf. Pesetsky 2000), but everything must be explained in terms of projection of alternatives.

Third, specific for *any* there is no direct relation between other indefinites like *some*. There cannot exist any rule that inserts *any* in certain contexts, and *some* in complementary contexts.

And fourth, for *any* it is often claimed that there is an apparent polysemy between free-choice *any* and NPI-*any*. This cannot be the case, pace Occam's Razor, and one of the major goals is to provide an analysis, which covers both meanings. There are many obstacles against a unified treatment of *any*, but with a slightly modified perspective on the semantic (and syntactic) structure of indefinites it will be possible to show that in fact there is only one *any* that behaves like *any*. On that treatment it will also become obvious, why we rarely find items cross-linguistically that behave exactly like *any*, being able to express both, the whole range of free-choice and weak negative polarity.

### 2.1. Preliminaries: the nature of *any*

Before going into detail, let us very briefly recapitulate the history of theoretical views on *any*. Since Klima there exists the idea that *any* and *some* are the same items distinguished only by a certain property relating to negative polarity. This view invited to conclude that *any* is an existential indefinite, on the cost of a unique lexical treatment, because the polarity sensitive (PS) and free-choice (FC) uses of *any* were impossible to reconcile. Ladusaw (1979) argues in this spirit, also Carlson (1980), but this way of treatment pertains in analyses which regard polarity sensitivity as an erratic grammatical feature of certain items (Linebarger 1987, Laka 1990, Progovac 1994). The siamese twin, FC-*any* has rather universal quantificational force (going back to Quine 1960, cf. Carlson 1981). The desire for an unambiguous lexical entry for both instances of *any* (going back as far as

Horn 1972) lead to several alternative accounts. For example, Eisner (1995) argues for *any* as a universal quantifier with the special restriction that it has to have wide scope over the negation/licensing operator at LF. The existential interpretation arises from the trace left behind. Although he gives quite interesting arguments, especially concerning FC-*any*, this extreme exploitation of Morgan's Law rests on the mere stipulation of an obligatory quantifier raising over its licensor. The presence of a licensor in his terms is obligatory in order to have a landing site for *any*. Although this sounds implausible on conceptual grounds, I will propose a likewise idea in the end of this chapter, but not referring to, or relying on the notion of quantifier scope.

Another direction was taken by K&L, who stress the similarity of *any* to simple indefinite nominal phrases. These can be interpreted existentially or – in certain contexts – generically. This position was further elaborated by Krifka (1995), Lahiri (1998), and Chierchia (2001), who build upon K&L's work. However, some aspects of the meaning of *any* remain still mysterious. (E.g, imperatives with a contextually salient domain of reference '*Press any of these two buttons*', or the subtriggering effect.) I will argue that the meaning of *any* is best captured if we acknowledge that it means '*just any*'. More precisely, I think that the original free-choice property of *any* (first described in Vendler's 1967 ingenious description of the 4 universal quantifiers in English with universal force – "*Take any apple*") is the actual key to all other features. See section 2.1.2 for further details. This claim needs some further justification, but in order to establish a basis for our arguments, let us take a closer look at K&L's and the relevant parts of Chierchia's account for *any*.

### 2.1.1. K&L: widening along a contextual dimension

K&L came up with a very simple and interesting idea: *any*+CN (common noun) is in principle equivalent to having the common noun with an indefinite determiner. But there are two additional restrictions: *any* widens the domain of reference of the noun (along a certain contextual dimension) and the meaning of the whole sentence must be strengthened, i.e. it must entail the weaker statement with just the indefinite. Consider the following examples.

- (1) a. I don't have potatoes, #not even rotten ones  
 b. I don't have any potatoes, not even rotten ones

The bare plural indefinite (1a) refers to a pragmatically relevant set of potatoes. The follow-up '*not even rotten ones*' presupposes that the domain of discourse already contains pragmatically irrelevant sets of potatoes (qua the focus marker *even*), which is cannot be the case. In (1b) the domain of (non-)available potatoes is widened, it potentially includes



all sorts of potatoes (decorative potatoes or a quantity of potatoes too small to be relevant, or even rotten ones.) Strengthening obtains under negation (as well as with other DE operators): if I don't have any kind of potatoes, be they relevant to mention or not, it is clear that I don't have potatoes relevant in discourse. While widening is taken as the actual contribution of *any* to the meaning of the indefinite noun phrase, strengthening is regarded as a condition on the contexts, where its use is appropriate.<sup>1</sup> Crucially, “*strengthening is to be satisfied by the ‘local’ proposition that any occurs in*” [K&L: 393]. This is in accordance with Linebarger's formulation of the ‘Immediate Scope Constraint’. But as we have seen before, there is a more profound explanation to this effect in terms of Chierchia's scalar implicatures. K&L give the following example:

- (2) \*It is not the case that every boy has any potatoes.

The basic claims of K&L's analysis are summarized below:

- (3) (A) *any CN* = the corresponding indefinite NP a CN with additional semantic/pragmatic characteristics (widening, strengthening) contributed by *any*.  
 FC The sole difference between PS [polarity sensitive] *any* and FC [free choice] *any* lies in the interpretation of the indefinite NP: in the case of FC *any*, it is an indefinite INTERPRETED GENERICALLY.
- (B) WIDENING  
 In an NP of the form *any CN*, *any* widens the interpretation of the common noun phrase (CN) along a contextual dimension.
- (C) STRENGTHENING  
*Any* is licensed only if the widening that it induces creates a stronger statement, i.e., only if the statement on the wide interpretation  $\Rightarrow$  the statement on the narrow interpretation
- (D) LOCALITY  
 Strengthening is to be satisfied by the ‘local’ proposition that *any* occurs in.  
 [K&L: 374]

These definitions resemble the licensing conditions of strong NPis in certain respects. But there are also certain differences. There is no direct reference to DE contexts, but on the other hand, widening together with strengthening typically occurs in DE contexts. If their definition is correct, the question arises whether there are non-DE environments, which

<sup>1</sup> K&L introduce strengthening as a condition without further external justification. They refute explicitly an analysis based on informativeness (Krifka 1990; but see arguments in Krifka 1995 why their criticism is not appropriate), where it would be a violation of Grice's maxim of Quantity to use a weaker statement, when a more informative one is equally available. Their argument is that violations of informativity normally do not result in grammatical ill-formedness.

still fulfill the requirement of widening plus strengthening. We will turn to this question below. Locality shows up like an old mate, but in K&L's account it does not follow from some other principles, it has to be stipulated, and they directly refer to Linebarger's Immediate Scope Constraint. Very important is the fact that K&L want to deduce the polar behavior of *any* from its semantic properties, and that they treat PS and FC *any* as the same item. It is just like the two sides of a coin, the difference between the two occurrences of *any* lies only in their semantic interpretation as a plain indefinite/existential or a generic/universal.

A very interesting observation made by K&L is that discourse linking plays a role in the licensing of *any*. (4) should be grammatical by virtue of the DE environment in the restriction of a universal quantifier (which contributes to widening and results in strengthening). But this is not the case. The explanation K&L give is that the whole relative clause containing *any* should contribute to a widening of the QP in the matrix, but *each*+CN has its reference fixed in discourse and therefore resists widening. (For a more detailed explanation, see the discussion of Vendler's (1967) account for universal quantifiers in section 2.1.2)

- (4) \*Each candidate who has any interest in semantics will be admitted to the department.

A very strong argument K&L give in order to support their analysis is the fact that in certain contexts also non-adversative predicates license *any*, which is quite puzzling in the light of what we have seen so far. Remember that only adversative predicates (among other intensional predicates) freely license NPIS:

- (5) a. I'm surprised / sorry that he ever said anything  
b. \*I'm sure / glad that I ever met him

Widening in K&L's terms takes place along a contextual dimension. How is this to be understood? In the following dialogue B's answer would be a blunt contradiction if she didn't mean that she was surprised on one dimension (because stealing a watch is a very risky and dangerous thing) but not on another (because the person they are talking about normally does crazy things.)

- (6) A: Were you surprised that he stole a watch?  
B: I was and I wasn't.

Now consider the following examples. (7) is from K&L, (8) is an equivalent sentence in German with the NPI *jemals* ('ever').

- (7) a. I'm glad ANYBODY likes me  
 b. Be glad we got ANY tickets!
- (8) Ich bin froh, daß ich JEMALS in Berlin angekommen bin.<sup>2</sup>  
 I am glad that I ever in Berlin arrived AUX  
 'I'm glad that I EVER arrived in Berlin'

(8), as well as the sentences in (7), has a very marked interpretation. Imagine the following scenario. I wanted to go from Vienna to Berlin by train on the direct way, which takes approximately twelve hours. Unfortunately, I took the wrong train and discovered that I was on my way to Moskow. So I had to get out in Budapest and make quite a long detour. Finally, after 20 hours travel I reached Berlin. Exhausted and annoyed by my misfortune I realize that I finally have made it to the desired destination. Reconciling with my fate I can utter (8) felicitously, without giving rise to pragmatic ill-formedness. How come? Still in Vienna, I had the unspecified wish to arrive in Berlin. In its narrow interpretation, this means sitting in a train for twelve hours before arriving there. This is the preferred scenario. Under its wider interpretation the wish expresses my attitude to travelling to Berlin no matter how I get there and when I arrive there. Now, if I am glad whenever my journey ends (successfully), no matter how it was, I would be glad a fortiori if I had gone directly and spent the least necessary time on trains. So the strengthening part of K&L's definition is fulfilled.

It is easy to show that other uses of *any* naturally fall under this analysis. Consider generic contexts. (9a) expresses a simple generic statement, which freely tolerates exceptions: baby owls and sick owls maybe do not hunt mice, it is irrelevant to consider those owls in a generic statement. On the other hand (9b) is a statement where tolerance of exceptions is reduced. Sick owls should also hunt mice, whereas baby owls may still count as an exception.

- (9) a. An owl hunts mice  
 b. Any owl hunts mice

What is crucial here is that through widening (and strengthening) the exceptions to the generic statement are "less tolerable". But this characterization equally applies to generics as it does to NPI/existential uses of *any*. From here it is a small step to integrate instances of free-choice *any*, by analyzing them as generics, similar to the determiner '*a*+CN', which may be interpreted existential or generic.

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<sup>2</sup> This example presupposes a very stable and scalar emotional attitude towards different situations. Nevertheless, with focus on *jemals*, it seems to be fully interpretable in the desired way. Still it improves if *jemals* is enforced by *überhaupt*, which in this sense corresponds to 'at all' in English.

Let us briefly summarize so far. K&L treat *any* as a determiner much akin to the standard indefinite determiner *a(n)*. The fundamental difference between the two is that the *any* contributes to the semantics of a NP/DP, it expresses a widened statement. Widening takes place along a certain dimension of (salient) properties and indicates a reduced tolerance of exceptions. Additionally, there is a requirement of strengthening: a sentence containing *any* must be stronger than a statement containing the plain indefinite. Although it could be argued that this requirement is due to informativity in a Gricean sense, they want to argue that it is rather an axiomatic part of the meaning of *any*. Strengthening must occur in the local proposition, thus they incorporate the locality constraints already formulated in Linebarger's proposal and earlier. Crucially, *any* is not taken to have its own quantificational force. It is neither intrinsically universal nor existential, but like the common indefinite determiner, its universal force is determined by the context.

In the following, we want to investigate how the two classes of NPis described so far, strong NPis and *any*, could be related to each other. When focus is involved, the correlation appears to be quite straightforward: focus creates (ordered) alternatives. Instead of minimal quantities, *any* expresses a minimally specified quality. Even irrelevant exceptions are part of the denotation of a NP/DP with *any* as a determiner. All other possible alternatives are more restricted, hence more specific. This automatically creates a scale very similar to the likely-hood scales already observed with strong NPis. The implicature carried along with scales of this kind is that the propositional schema must be true not only of the element in focus (the minimal element), but also for all other alternatives. I believe that it is not necessary to assume a covert *even*, as argued in Horn & Lee (1994); the right semantics of focus can be derived by the scale and its implicature alone. As a consequence, we observe the same affinity to DE-contexts as with strong NPis. And also strengthening can be independently motivated as a necessary prerequisite in order to avoid contradicting implicatures. But all this only pertains when the noun phrase with *any* is in focus, not when *any* as a modifier is in (meta-linguistic) contrastive focus or when (narrow) focus is not present at all.

Let us follow the course laid out in K&L's analysis. At a certain point they speculate on the question, whether their analysis involving widening as the semantic contribution of *any* holds only in cases where *any* bears also emphatic or major stress. The following examples suggest that without major stress there is no widening involved, in fact, these examples sound very neutral.

- (10) A: Why don't we make some French fries?  
 B: Because we don't have any potatoes.  
       (any completely unstressed)
- (11) A: Are you prepared for school tomorrow?  
 B: Yes. We didn't get any homework.  
       (any completely unstressed) (K&L: 363)

They argue convincingly that emphasis is not a sufficient condition for widening, or what they call it 'real widening'. The difficulty is that when a universal quantifier is stressed, it stresses the fact that the maximal domain of reference is intended to take part in the evaluation of the quantifier. On the other hand stress on *any* automatically shifts the domain of reference denoted by a common noun to a state where potential exceptions are also included, hence widening. This can be exemplified by the following contrast:

- (12) a. Every match I strike lights.  
       – Not ANY match, of course, a wet one doesn't.
- b. #Every match I strike lights.  
       – Not EVERY match, of course, a wet one doesn't.

(12b) seems odd because the continuation contradicts the first sentence, whereas with *any* the continuation is natural, *any* widens the meaning of match, now including dry and wet matches. That emphatic stress does not automatically induce widening is not surprising, more interesting is the question whether stress is not a prerequisite to widening; in other words, whether it would be a necessary condition. In contexts where *any* is licensed by a DE operator other than negation, it seems to be true that the examples with *any* are less tolerant of exceptions than their plain indefinite counterparts.

- (13) a. Every student who handed in (some) homework will get a prize.  
       b. Every student who handed in any homework will get a prize.
- (14) a. Before you make (your) plans, consult the secretary.  
       b. Before you make any plans, consult the secretary. (K&L: 367)

While it remains a bit mysterious why widening is not perceivable in the examples (10–11), where *any* is licensed by negation, it still can be detected by using continuations.

- (15) a. We don't have potatoes, or at least not enough.  
       b. #We don't have any potatoes, or at least not enough. (K&L: 368)

The continuation ‘or at least not enough’, indicates that the preceding statement may be false if small, insufficient quantities of potatoes are taken into account. This is compatible with the indefinite in the (a) example, since the extension of potatoes may be restricted to reasonably big quantities. The oddity of (15b) can only be explained if widening in fact has taken place with (unstressed) *any*, because only then the extension of potatoes also contains irrelevant quantities of potatoes as well (the contextual dimension being quantities in that case). One more example K&L come up with is yes/no questions. Consider the following pair of sentences:

- (16) a. Is there something I can do for you?  
       b. Is there anything I can do for you? (K&L: 367)

The (b) example is used in more polite contexts. K&L attribute this to the effect of widening, *since “the attendant doesn’t presume to be able to help the customer with something really important and the attendant agrees to take the trouble even for something small.”* I do not fully agree with this reasoning. Remember that Lakoff (1969) described the difference between *any* and *some* in certain contexts in different terms: *some* comes with an existential presupposition, or a positive expectation, whereas *any* is rather neutral. I assume this to be the case here as well. *Some* presupposes something, therefore the question is not polite, since the offer would have to be explicitly denied if the customer would not want to be helped, whereas *any* leaves it open whether there is something to do or not for the customer.

While K&L’s account is quite appealing, I will assume a minimally different viewpoint here. It may well be true that widening is always part of the meaning of *any* by virtue of some meaning property to be elaborated further on. At least in the aspect that it does not tolerate exceptions easily. But I think that the whole mechanism of widening plus strengthening is only observable if *any* is in fact stressed, that means in emphatic or contrastive focus. In this case it behaves like any other strong NPI with the only difference that the scale is not defined over quantities but along a contextual dimension, involving salient properties in K&L’s terms, which may or may not restrict the extension of the noun. In all other cases, widening may not be perceivable because no alternatives are associated with the noun phrase containing *any*. Therefore strengthening, pragmatically always inferable though, cannot be checked from within the meaning of the sentence. The difference in perspective may be subtle, but it is a strong point against analyses which simply take *any* as the ‘counterpart’ to other items such as existential *some*, or the indefinite determiner. I have to note that this point does not carry over to K&L’s account directly, since nothing hinges on this comparison in their argumentation. In fact, they do not mention *some* and they explicitly state that *any* is equal to an indefinite plus a certain semantic contribution specific to *any*.

At the end of their paper they offer a very interesting way of formalization when discussing generics. One of the crucial examples is modification with *almost*. When applied to quantified noun phrases, it is claimed that the quantifier must be universal (or negative). Just notice that these are exactly the 2 classical instances of operators, which are DE on their first argument.

- (17) a. \*Almost an owl hunts mice.  
 b. Almost any owl hunts mice.  
 c. \*Almost some owl hunts mice.  
 d. \*Almost many owls hunt mice.  
 e. Almost every owl hunts mice.  
 f. Almost no owl hunts mice.

Generics (as well as free-choice *any*, which K&L subsume under generics) can be assumed to involve a covert universal operator. Then (17b,e) are straightforward, (17f) is also clear when we take the generic universal to have wide scope over negation,<sup>3</sup> but the problem is (17a), the generic use of the indefinite determiner.<sup>4</sup> The semantics K&L propose for the generic indefinite roughly looks like (18b), where  $X_{owl}$  is the set of properties which define an object to be an owl.

- (18) a. An owl hunts mice.  
 b.  $\forall [ X_{owl} (Owl)(Hunts\ mice)$

K&L suppose that “*certain owls which do not hunt mice may be regarded not as refuting the sentence, but rather as legitimate exceptions. For example, if ADULT is one of the properties in  $X_{owl}$ , then the quantification is over adult owls only, ...*”. But there must be more to it, since otherwise the generic use of *any* would just be like contextually restricted universal quantification. There must be a way to explain the special behavior of these generics with respect to tolerating exceptions.

The crucial point about generic statements is that the restricting set of properties is vague. The context may provide a partial specification of this set, but the set as a whole remains underspecified. (18a) in their terms means something like ‘*all normal (possible) owls hunt mice, where what counts as normal is inherently vague,*’ but there is no commitment to a way of making precise what ‘normal’ counts for in the given context.

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<sup>3</sup> It is not clear whether in (17f) the subject should be interpreted generically or not. But notice that the sentence is ok also if *no owl* is understood existentially. *Almost* can only modify complete sets with no exceptions, because its only contribution to the meaning is that there are exceptions to completeness.

<sup>4</sup> One could think of an analysis that attributes different properties to generics (i.e., reference to kinds). But then the sentence with *any* calls for a different analysis as well.

Thus, for a generic statement, there is no well-defined set of objects that the quantification ranges over. When an object does not fall under the generalization expressed by the generic sentence, it may well be that it was not supposed to be within the set of objects, hence constituting a legitimate exception. With this in mind, it becomes clear why generics do not ‘count’ as universals regarding modification with almost. While they involve a universal operator, the restriction of the domain the universal ranges over is inherently vague (‘domain vague’ in K&L’s terms), as opposed to ‘domain precise’ instances of quantifiers (e.g., universal quantifiers). A quantifier is domain precise if for every context any potential set of properties, which could make the domain of reference of a given object more precise, does not change the set of objects, i.e. does not create exceptions.

What are the properties of domain-widening *any* with respect to quantificational domains? K&L claim that for any property in the (vague) set of potential ‘precisifications’, that property will be removed from this set as well as from the set of (implicit) precise properties restricting the domain. In other words, if a generic sentence about owls had the property ‘healthy’ either in the precise part of the restriction or in the set of ‘precisifications’, then after widening this property no longer counts. I.e., non-healthy owls also have to be in the set of objects we are talking about. There must be no exceptions along the line ‘sick’ versus ‘healthy’, and any owl, be it sick or healthy has to hunt mice in order to make the statement true. K&L show that a noun phrase quantified over by (FC) *any* is in fact a universal quantifier with respect to every property potentially restricting the domain of reference. But this holds only for a given context, whereas simple universal quantifiers fulfil this requirement for every context (domain precise universals). *Any* is universal with respect to its dimension of widening, or as K&L put it, *any* CN is a ‘dimensionally universal’ noun phrase.

I believe that this characterization of the semantic properties of *any* went further in the direction of a deep understanding of NPIS than any other previous account did. What is behind widening is the removal of salient properties, which (potentially) restrict the noun phrase. The term ‘removal’ suggests a dynamic or derivative process, but if we look at it more relaxed, it only expresses the difference of *any* to NPs with an indefinite determiner. The actual mechanics of their analysis of widening, however, lacks a bit of conceptual motivation, since it is hard to imagine that salient properties always enter the evaluation of a restriction set of quantifiers. Their problem seems to be that they want to establish widening as an effectual semantic property of *any*, rather than deriving the actual properties of *any* from its potential to express a widened statement. If we push this line of reasoning a bit further, we could assume that *any* in fact ‘means’ that the whole NP refers to a contextually unspecified (and not specifyable) set of instances conforming to the meaning of the common noun itself, which constitutes a property (see Krifka 1995). This is indeed what I also want to argue for as the basic property of *any*.



Notice that the strengthening part of the meaning proposed by K&L does not follow from this definition. They have to stipulate it as part of the meaning, since they (in my view correctly) reject grounding solely in terms of informativeness in the sense of Gricean implicatures. I think this is a crucial point and explains why they have to speculate about the role focus plays. While I still agree with them that (potential) widening is an integral part of the meaning of *any* and independent from focus, real strengthening (against a sentence containing just a plain indefinite) can only be observed when focus is involved. When a constituent is in focus, there will be activated alternatives (ordered with respect to the constituent in focus in terms of entailment). If these alternatives also belong to the same dimension (be it a scale of quantity, or a scale defined by the presence or absence of a salient property in K&L's terms), these entailment relations are independent of focus. By virtue of implicatures arising as part of the strong meaning of scalar terms in the line of Chierchia, it has to be guaranteed that these implicatures do not contradict each other. (This is a requirement fair enough to ensure that a given statement makes sense.) In the next subsections I will discuss the contribution of Chierchia's analysis and also try to explain why *any* in focus still behaves slightly different from strong NPIS. The last subsection will concentrate on *any* without focus and add some diachronic speculations, how this highly peculiar meaning of *any* could arise.

### 2.1.2. Chierchia: domain expansion and universal closure

Let us further explore the analysis Chierchia (2001) proposes specifically for *any*. Primarily he builds upon K&L's analysis. Widening, he proposes, is a function  $g$  from sets into sets:

- (19) Let  $g$  be an increasing function from sets into sets (i.e. for any set  $D$ ,  $g(D) \supseteq D$ ).  
Then:  $\exists_D x [\varphi]$  entails  $\exists_{g(D)} x [\varphi]$ , where  $D$  is a quantificational domain.

This function is very similar to the scales we encountered already before. Both rely on asymmetric entailment. However, it differs from the scales described previously in that a) entailment is relative to a (quantificational) domain and b) the ordering relation introduced by entailment contains only two sets, the 'normal' extension of the noun phrase, and its widened counterpart. (The universal character of the widening function is brought in later by universal closure.) The definition in (19) also includes an implicit reference to upward entailing functions. If one can infer the truth of a statement with a noun phrase that has a wider extension from a statement with the regular noun phrase, this is exactly what upward entailing means. Under DE functions, the direction of entailment is reversed and the widened meaning results in the stronger statement. For the strengthening effect, as a first approximation, Chierchia invokes informativeness again (cf. Krifka 1995): widening must

not result in a loss of information, hence it must take place in a DE environment. Chierchia concedes that this characterization is a bit too imprecise, but also that K&L's stipulation of strengthening as part of the meaning of *any* does not help any further. In order to indicate a way out of this dilemma, he draws a direct analogy of the behavior of NPIS to that of scalar implicatures. Referring back to K&L's locality restriction, he notes that there is in fact a 'roofing effect' with NPIS, apparently lacking from scalar implicatures. While scalar implicatures are re-calculated each time a DE-operator occurs in the structure of an utterance, NPIS just 'seek' the next DE operator, which introduces scalar implicatures, and check the indirect implicatures against their own intrinsic scalar implicatures. (Notice that we have already seen that this roofing effect can in fact be derived from the mechanics of scalar implicatures themselves.) The next step Chierchia takes is to reformulate K&L's characterization in the following way:

(20)  $\text{any}' = \lambda P \lambda Q \text{ some }_{g(D)}'(P)(Q)$  (where, for any  $D$ ,  $g(D) \supseteq D$ )

(21) Strengthening/blocking:

Domain expansions must be universally closed. Such closure must lead to strengthening with respect to the meaning of the plain indefinite.

The formulation in (20) captures domain widening as a function from sets into sets, contrary to K&L's more complex explanation based on salient properties. Unfortunately, Chierchia uses the old paradigmatic *any/some* opposition, which is very problematic per se. We could replace *some* by an abstract indefinite, still.<sup>5</sup> In (21) reference is made only to a notion 'plain indefinite', but Chierchia explicitly refers to competing sentences, one of them containing *any* as a lexical item (with its domain widening function associated) and the other containing *some*, which lacks a domain widening function. The strengthening / blocking constraint itself ties *any* to quantification and in turn to domain restriction, in this case universal closure.<sup>6</sup> It must be noted that the introduction of a universal operator ranging over domain expanding functions, which leads to strengthening, may be criticized as a stipulative move. However, the benefits are obvious: when quantification is involved,

<sup>5</sup> See also Szabolcsi (2002) for an interesting account on positive and negative polarity items. Although I do not adhere to her semantic implications at all, it comes out very clear that *some* must be regarded differently than just the plain indefinite counterpart to *any*.

<sup>6</sup> Under a very conservative understanding of the term 'blocking', its application in the context of *any* may be criticised the following way: The application of a certain rule (be it lexical insertion, or a syntactic rule) should be blocked, if the application of a simpler rule, where we have to rely on some definition on markedness, or the non-application of the rule under discussion would give us the same result. Since *any* and whatever alternative to *any* do not mean the same thing from the start, we should not be able to compare them in a sensible way. For that reason I am more inclined to adhere to Krifka's analysis in terms of pragmatically motivated conditions on felicitous uses of illocutionary operators. Seemingly, Chierchia is taking the same route.

one can easily assign scope, and scope of quantification can also be rendered with precise locality conditions. As already noted in the context of strong NPis, Chierchia introduces his ‘mapping hypothesis’, namely that the domain of DE operators is mapped onto the scope of the universal operator (which ranges over domain expanding functions).<sup>7</sup> Hence, the roofing effect becomes an integral part of the syntax and semantics of NPis.

This mapping appears less obscure if we relate NPis to scalar items. In the case of strong NPis one has to make sure that the likelihood scale introduced by the (potentially salient) focus marker even does not create a conflict with the scalar properties of the NPI itself. On the other hand, with *any* one seems to be obliged to stipulate some obligatory strengthening requirement, possibly related to informativeness, as for example proposed by Krifka (1995). But if we examine closely the entailment relations introduced by domain widening, we see that *any* behaves much like scalar items in the relevant contexts, so there is a good chance that we can do without recurrence to conversational implicatures.

What we have found out with regard to scalar NPis is that a) the roofing effect is not so robust as assumed (it is restricted to anti-additive licensors, which do not introduce novel existential implicatures when being in the scope of a higher DE-operator); b) its properties can be derived from the computational properties of scalar implicatures alone, and finally c) that the introduction of quantificational domains is an integral part of the licensing mechanism. While Chierchia alludes to roofing as the main difference between scalar implicatures and strong NPis, under a closer look it does not play any fundamental role anymore. However, the mapping hypothesis proposed by Chierchia (in order to ground the apparent roofing) is needed anyway, but only in order to establish the relevant quantificational domain. This move seems more plausible, since quantification always applies relative to certain domains.

Until now, I have kept relation between strong NPis and *any* a bit vague. Despite the fact that they are closely related and have many licensing environments in common, there are some fundamental differences. In the next section I will review some considerations about the semantic nature of *any* with particular reference to the debate whether *any* should be regarded as an existential (just like any other indefinite) or a universal quantifier. Before doing so I think it is time to reconsider in detail Vendler’s characterization of *any* as an

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<sup>7</sup> Chierchia, while admitting the possibility that ‘roofing’ might be derived from semantics alone, also explores the option that NPI licensing *must* also have a morpho-syntactic counterpart. In his words, “*it is thus expected that the morphology of NPis must agree with the morphology of some suitable head [...] a DE head (any other choice would lead the interpretive component crash). So we may assume that DE heads carry a feature that, when active, must be checked by an NPI. This feature marks in syntax possible scope sites for closure [...]*” While it is desirable to explore the reflections of the behavior of NPis in syntax, I would want to object that we might in fact create a circular argument. If we introduce some feature in syntax, which has the semantic properties we want it to have, it is not really informative to derive semantic effects from syntax.

item expressing freedom of choice in the paradigm of universally quantifying elements. Then, in section 2.2 I will explore a slightly diverging option, which is based solely on what the semantic specifics of *any* are. When we carefully import the implications of K&L and Chierchia's proposals, we arrive at an explanation for the polarity sensitive behavior of *any* without much stipulative recurrence to additional notions.

### 2.1.3. *Freedom of choice (Vendler 1967)*

One of the most interesting and astonishingly precise investigations on the meaning of *any* can be found in Vendler's (1967) chapter on the four instantiations of the universal quantifier in English: *each*, *every*, *any* and *all*. His major point is that while it is a desirable move and fruitful enterprise to subsume them under one element of symbolic logic, certain aspects of their meaning, which are definitely not stylistic but reflect different truth conditional properties, are entirely lost under this perspective.<sup>8</sup> Consider the following set of sentences:

- (22) a. A tiger is an animal.  
 b. Cats love mice.  
 c. The viper is a poisonous snake.  
 d. All men are mortal.  
 e. Every paper I read ran the story.  
 f. Each letter I sent was intercepted  
 g. Any doctor will tell you what to do. [Vendler 1967: 70]

All the underlined noun phrases are used to express a general statement. But, in Vendler's terms, "these devices are not freely interchangeable." As we already know, free-choice *any*

<sup>8</sup> In the text, Vendler explicitly refers to Quine's *Mathematical Logic*. While "even if it is not claimed that the theory can account for all the aspects that are involved in the correct use of these linguistic media, it is commonly maintained that the logically important features are well brought out..." Moreover, "... some ambiguities and obscurities are indeed cleared away by the technical devices at our disposal." But Vendler objects that "Elated by this success one is naturally inclined to force all sentences in which these particles occur into the strait jacket prescribed by the theory of quantification, suppressing thereby, I fear, other aspects, among them logically important ones, that enter into the common understanding of these words. The fact that the theory has succeeded in clarifying some logically important points does not show that all the remaining points are of a mere stylistic but not logical interest; the fact that the cake once has been cut with success does not mean that this is the only profitable way of cutting the cake. More specifically, I have reasons to think that the method of lumping each, every, all and any together and treating them as stylistic variants of the same logical structure tends to obscure issues concerning the type of reference, existential import, and lawlike form of general propositions." [Vendler 1967: 71f]

requires at least a certain modality, and each is not meant to express a simple generic statement, whereas simple indefinite or definite noun phrases will lose their generic potential under past tense.

- (23) a. \* Any letter I sent was intercepted.  
 b. ?? Each cat loves mice.  
 c. % A paper I read ran the story.  
 d. % The letter I sent was intercepted. [Vendler 1967: 70f]

Leaving aside for a second the “less consistent any”, the difference between the three quantificational expressions *every*, *each* and *all* becomes evident if we consider special contexts. There are certain predicates, which require a cumulative or reciprocal meaning:

- (24) a. All those blocks are similar.  
 b. All those blocks fit together.  
 c. The number of all those blocks is 17. [Vendler 1967:72]

The respective counterparts with *each* or *every* are either completely impossible or they express sentences with different truth conditions: adding the modifier *other* to *every* makes the sentences more acceptable, however, they express exhaustive reciprocity, which the original sentences with *all* do not, therefore it is clear that the quantifiers have different truth conditions.

- (25) a. Each/every one of those blocks is similar \*(to every other).  
 b. Each/every one of those blocks fits \*together/every other. [Vendler 1967: 73]

‘Being similar’ is a relational property, which is defined over different characteristics. It could be the case that each member of the set of blocks has one or more members of the same set with identical characteristics, but not all members share one common characteristic. This situation is even more plausible with the predicate ‘fit together’. Vendler proposes the example of a jigsaw puzzle: all the pieces fit together without each piece fitting every other. Finally, indicating the number of elements of the set is fine with *all*, but generally impossible with *every* or *each*:

- (26) \*The number of each/every one of those blocks is 17. [Vendler 1967: 73]

The difference between *all* on the one hand and *every/each* on the other is that *all* is used to express a collective meaning, whereas the other two are used in a distributive sense. Those two meanings, applied to relational predicates, result in different truth conditions or

sometimes in improper statements (if the relation cannot be established). But the differences between the two meanings also explain why all normally goes with plural or mass nouns, and *each/every* always go with singular (countable) nouns. Finally, consider an example with a quantificational object. The statement with *each/every* indicates, depending on the items in the store, that one could make a good bargain. The same statement with *all* is sheer incredible, unless the items in the store are worth nothing:

- (27) a. Each/every item in this store costs \$5. [Vendler 1967: 75]  
 b. All items in the store cost \$5.

The difference between *every* and *each* is much more subtle. While *every* seems to distribute over the elements in the restriction set just among the other elements, *each* rather takes the elements one by one. Vendler comes up with an interesting example to illustrate this: the (b) sentence of the following example sounds odd, since no day is a second or third day without a reference to other days. *Each* takes the days one by one, but each one in isolation with respect to other elements of the set.

- (28) a. He came every/each day.  
 b. He came every/??each second day/three days. [Vendler 1967: 76f]

A good source of inspiration is to investigate the diachronic morphological development of grammatical items: *every* comes from *ever each*. Vendler speculates that the former collocation of *ever* and *each* grammaticalized in order to “*sum up the distribution characteristics of each*”. In that sense, *every* is a bit closer to *all*, since its meaning still has the whole restriction set accessible, whereas *each* does not really care about its restriction. An interesting observation is that *every* “becomes pompous” if the restriction set is explicitly small, such as containing only two elements.

- (29) a. Each of the two...  
 b. %Every one of the two... [Vendler 1967: 77]

To my opinion, Vendler’s work is so important not because it offers a thorough and exhaustive formalization of how the semantics of these quantifiers should be defined, but because he takes exactly the reverse approach. Before even thinking of a more intricate formalization, one has to examine which properties would distinguish the items under discussion. Let us slowly move towards *any* by using an example with interesting pragmatic subtleties. Suppose there is a basket of apples and the speaker says:

- (30) Take all of them. [Vendler 1967: 77]

The reaction to this offer would be infelicitous if the other person starts to pick the apples one by one. The offer meant to take the apples, if possible “en bloc”, consistent with the collective meaning. The same utterance with *every* is rather neutral with respect to how to pick the apples up, provided none are left behind. It stresses completeness, or exhaustiveness. On the other hand *each* “directs one’s attention to the individuals as they appear [successively].” Therefore an offer like (32a) gives a feeling of non-completeness, the usage of *each* appears to be vacuous.

(31) Take every one of them

(32) a. Take each of them

b. Take each of them and examine them in turn [Vendler 1967: 78]

Now, finally, let us turn to *any*. Vendler, to my content, states that “the meaning of *any* is a many-splendored thing. No example, in itself, could suffice to exhibit its wide variety of aspects.” Just consider the previous sentence, this time with *any*. The expressed offer is not as generous anymore, at least concerning quantity. In fact, the speaker offers only one apple among the basket full of apples.

(33) Take any one of them

The only generosity left behind is in the sense of generality: it does not matter at all, which of the apples is taken from the basket. It is important to note that this is not mere lack of determination. An offer like “Take one (of them)!” potentially lacks determination as well, but this is not guaranteed. The offered person might ask back “Which one?”, just in order to make sure. An offer like (33) is explicit: determination is up to the offered person, and it would be inappropriate to ask which one to choose. “Unrestricted liberty of individual choice” is granted. It is interesting to notice that this property of *any* excludes coercion. While the imperative is appropriate with *any* in order to express a generous offer, it cannot be used with modals or verbs expressing an order. (Excluding a meta-linguistic reading where the command would be to disregard determination and to take “just any apple, not looking at them, just the one which happens to be the first.”).

(34) a. \*I ordered/forced/compelled him to take any.

b. \*You must take any. [Vendler 1967: 80]

The label Vendler gave to this peculiar aspect of this use of *any* is: “freedom of choice”. He notices that this is an essential feature. Situations which exclude such freedom do not permit the use of *any* in a sensible way. So, for example, after picking out one apple from the basket, a description of what the hearer did could be “He took one” or “He took the one

he liked”, but never “He took any one”, even if this corresponds to the wording of the previous offer. “*Any calls for a choice, but after it has been made any loses its point.*”

A second feature of *any* is its indifference of size. In the initial sentence we restricted the size by the quantifier *one*, but the offer could have been a bit more generous by saying “Take any two” or “three apples”. The immediate scope of *any* itself is indetermined regarding the size of the subset to be chosen. “Take any apples” implies to take any amount of apples, with an interesting upward limit: it cannot mean an offer to take all apples, since then “*the freedom of choice would be vacuous and, consequently [the] use of any senseless*” [Vendler 1967: 82]. The immediate scope of *any* cannot exhaust the total “population”; Vendler calls this last property of *any* its incompleteness, but notice that it actually follows from the first two properties.

A more complex example Vendler comes up with also shows these properties nicely. Consider the following commercial, which could be reformulated as a conditional:

- (35) a. Any doctor will tell you that Stopsneeze helps.  
 b. If you ask any doctor he will tell you ... [Vendler 1967: 83]

How could we prove the validity of the advertiser’s claim, or of the conditional forecast? If we replaced any doctor with Dr. Jones we could go ask him whether Stopsneeze helps, and if he agrees then the prediction is borne out. But the validity of the original advertisement will not improve even if we spend years asking doctors and record their reactions. It would be just the same as if we didn’t ask any doctor in reality. More interestingly, the pronoun in the consequent of the conditional cannot have an external referent. And finally, returning to our vain survey of doctors’ reactions, it is impossible to state something like:

- (36) a. He said that any doctor would tell me that Stopsneeze helps.  
 b. \*I asked any doctor(s), and he (they) told me that Stopsneeze helps.

Vendler concludes that what the conditional with *any* N expresses is a blank warranty for the conditional prediction: whatever referent one would try out, the conditional should hold, but if one does not test the conditional it is just as if the warranty was not used. Such advertisements are rather claims than statements, which could be true or false; their measurement is rather reliability than correctness. The ‘testing against real doctors’ metaphor helps us to link up to the properties of *any*. To verify the claim is tantamount to the challenge of asking freely any amount and any selection of doctors (freedom of choice and indifference of size). And due to the implicit incompleteness the claim does not lead us to even try to find every doctor in the universe. Once again: we need not really ask any doctor (even if we are tempted to do so out of curiosity). The pragmatics of other, similar sentences suggests that we do not aim at any substantiation:



- (37) a. Anybody trespassing on the premises will be prosecuted.  
 b. Any perpetual-motion engine would violate the laws of thermodynamics,  
 which is impossible. [Vendler 1967: 87]

Vendler calls this property “lack of existential import”, and it follows from the fact that the conditionals or modal propositions we considered so far do not presume to identify any referents; the reference of the *any*-noun phrases remains indefinite strictu sensu. Vendler uses an illuminative metaphor: “*We were not interested in the fish caught in the net, but in the net that might catch certain fish; and we were not disturbed if, in fact, it did not catch any.*” It is interesting to compare all the 4 quantifying elements from the beginning of this section against this property. Suitable contexts are negation and questions:

- (38) a. Did you see all the pigs / every pig in the pen?  
 b. I did not see all the pigs / every pig in the pen.
- (39) a. Did you reply to each letter?  
 b. I did not reply to each letter.
- (40) a. Did you see any pigs in the pen?  
 b. I did not see any pigs in the pen. [Vendler 1967: 90]

While the questions and negated sentences in (38,39) presuppose the existence of a referent, in this case of pigs or letters (the quantifier is in the scope of negation or the question operator in these sentences, not its restriction or its nuclear scope), the same constructions with *any* (40) do not indicate existential import. Notice, however, that only the question is neutral (40a), in accordance with Lakoff’s observations and counter negation-based analyses of NPis like Linebarger’s. In (40b) the *any* NP clearly is in the scope of negation, but in this case also existence is negated, just if it were an ordinary indefinite NP. There is an interesting parallel, which has escaped notice so far: the collective quantifier *all* may be interpreted with existential import, but it need not. In modal (counter-factual conditional-like) sentences it rather patterns with *any* than with the two other distributive quantifiers *every* and *each*.

- (41) a. Each (every) message you sent was intercepted.  
 b. All the messages you sent were intercepted.  
 c. \*Any messages you sent were intercepted.
- (42) a. ??Each (every) message you might have sent would have been intercepted.  
 b. All the messages you might have sent would have been intercepted.  
 c. Any messages you might have sent would have been intercepted.  
 [Vendler 1967: 90f]

As (42a) shows, the distributive quantifiers are rather odd when restricted by counterfactual relative clauses. This makes sense if one assumes that vacuous distribution is prohibited. The quantificational properties of all are not so strict, existential import may be due to certain referential devices (definiteness) but nothing forces us to enforce an independent existential presupposition; the sentences with all all make sense, regardless of the referential properties of the NPs headed by all. On the other hand, *any* explicitly precludes such a presupposition while eagerly playing the part of a universal in sentences, which are at least neutral about existential import.

In the end of the chapter Vendler stresses the affinity of *any* towards law-like propositions. *Any* does not occur in statements of fact (since this would abduct freedom of choice); hence these propositions cannot be verified in a straightforward sense. Confirmation is still possible, however, in an inductive sense. Suppose we would like to make a general statement about ravens. Without any further restriction, it is somewhat deviant to use *any*, but adding a modal restrictive clause improves the sentence. Now compare the following statement(s) with its counterpart containing the distributive universal:

- (43) a. Any raven ?(you might select) is black.  
 b. Every raven (in the universe) is black.

The second statement can easily be refuted supposed one believes in the existence of albino ravens, so the probability of the claim is zero. (43a) on the other hand calls for a different strategy. In order to confirm the statement, one only has to examine the color of a freely chosen set of ravens. The probability to find an albino among this set is very low, and it does not really matter how many ravens exist in the universe and how many ravens I examine (supposed albino ravens are rare). The probability of the claim to be true is equivalent to the ratio between the whole set of ravens and potential exceptions to the claim. It will not change after any successful examination, even not after stumbling upon a counter-example, i.e., a white raven. A claim, or law-like proposition cannot be plainly true or false, but it can be correct, and the measure for correctness is its probability, thus expressing a probabilistic match towards reality.

Vendler concludes his chapter on universal quantification with an interesting remark. *“For we have reasons to hope that a close analysis of the use of this last particle [any], together perhaps with corresponding logical models, might open up a new line of attack on the problem of lawlike propositions. And in these matters a hope is an achievement.”* [Vendler 1967:96] The reason why I have discussed Vendler’s analysis in such detail is that in principle we have returned to the same point as far as the semantic properties of *any* are concerned. There have been major achievements regarding negative polarity phenomena in a broader sense. But with certain exceptions the analyses have rather

reflected the state of the art of semantic or syntactic theories than directly tackling the problem of specific meaning properties, which have effects on more than one level of grammar and might even affect the definition of interfaces between morphology, syntax, semantics, and pragmatics. And with respect to *any*, there is still no satisfactory explanation to all peculiarities of its behavior. Vendler highlights the generic/universal properties of *any* (without making the mistake to take the universal meaning as the core property). The opposite view, often taken by those who aim at a very simple formalization of negative polarity, stresses the existential side of *any*, which prototypical surfaces in the connection with negation. In order to shed some more light on this issue, let us briefly review Horn's (2000a) critical survey on the theoretical status of *any*.

#### 2.1.4. *Existential versus universal* (Horn 2000a)

In his article, Horn (2000a) discusses certain possibilities to capture the divergent behavior of *any*. Each of the following options has been followed by certain researchers, each of them bringing up a list of arguments in favor of the respective theoretical line. The three main options are: a) *any* as a universal with obligatory wide scope over its licenser, b) *any* as a (lexically or at least semantically) ambiguous item, toggling its character from a free-choice universal to a NPI existential according to its context, or c) *any* as a univocal indefinite, where its different characteristics are akin to the behavior of plain indefinites, which may have a generic or existential interpretation. The core dilemma is the relation between occurrences of *any* as a genuine NPI and other occurrences, in which *any* is usually labeled as a free-choice (FC) item. The relevant contrast is repeated below:

- (44) a. I didn't see any pigs  
 b. Can any pigs fly? (NPI)
- (45) a. I can catch any raven  
 b. Can ~ANY raven fly? (FC) [Horn 2000a]

The first possibility is to treat both occurrences of *any* as a universal, which takes wide scope over its licenser, be it negation, a modal or a generic operator. A simplified logical form of the above sentences would univocally be like in the following example, where the universal operator has widest scope:

- (46)  $\forall x, x \in \{\text{pigs, ravens}\}: \{\neg, \diamond, \dots\} (I \{\text{saw, catch}\} x).$

Horn cites a list of linguists whose work about *any* could be attributed to this idea. For the full list, the reader is referred to the original paper, just let me mention a few: Reichenbach

(1947), Quine (1960), LeGrand (1975), Eisner (1994/95), and interestingly the 3<sup>rd</sup> chapter of his own dissertation Horn (1972).

While conceptually preferable (qua Occam's Razor), the wide-scope-universalist approach has to fight seriously with empirical problems. The three main arguments against this kind of unified approach are: a) LF configurations which are clearly inappropriate, b) so-called A-adverbs (like *almost*) can only modify free-choice *any* but not NPIS, and c) *there*-insertion, a typical test for existential contexts, is fine with polarity-*any* but not with free-choice *any*. The following examples will illustrate these arguments in detail. First, consider the following sentence with two possible logical forms. In the first anybody is treated as a wide-scope universal, in the second as an existential with narrow scope. As already noted in Fauconnier (1979), (47a) cannot be understood as wide-scope *any* (b), but only the LF in (c) is a valid logical representation.

- (47) a. I wonder if Susan married anybody.  
 b.  $\forall x$  (I wonder if Susan married x)  
 c. I wonder if ( $\exists x$ ) (Susan married x)

A putative test for universal contexts are approximative (A-)adverbs: *absolutely* and *almost*. It should be noted that these adverbials do not directly correspond to universality per se, they rather require some sort of completeness as a semantic feature of their argument. However, these adverbs just cut across the NPI/free-choice line:

- (48) a. Absolutely/almost anyone can cook Peking duck. [FC]  
 b. Can absolutely/almost anybody swim the Channel? [FC / \*NPI]  
 c. \*Sam didn't see absolutely/almost anyone. [\*NPI]

*There*-insertion demands the subject NP to be potentially existential; with universals these sentences are clearly ungrammatical, the same holds for contexts which favor a free-choice interpretation of *any*.

- (49) a. There is {somebody / \*everybody / anybody} that can swim the Channel.  
 b. There isn't anybody that can swim the Channel. [\*FC]  
 c. If there is anybody that can swim the Channel, I can do it. [\*FC]  
 d. \*If there is absolutely anybody that can swim the Channel, I can do it.

The apparent solution to this dilemma is to (lexically) discern two kinds of *any*. One is an existential and fits well into the class of NPIS, while the other is interpreted as a universal and is bound to modal or generic statements. People whose work could be attributed to this

conception are DeMorgan (1986), Ladusaw (1979), Carlson (1980, 1981), Linebarger (1981, 1987) and the 2<sup>nd</sup> chapter of Horn's (1972) dissertation. I have to add that early proposals on NPis in purely syntactic terms also have to adopt the ambiguity hypothesis, this is implicitly true of Klima (1964), but also Laka (1990) and Progovac (1988, 1994) only consider the existential/polarity characteristics and make sure to attribute diverging behavior to a different *any* (i.e. free-choice). The debate, whether there are more than one discernable senses, or even lexical entries for *any*, or whether they can all be subsumed under one item and one meaning goes back to the philosophical dispute between Hamilton (1858) and De Morgan (1861, 1862): while Hamilton tries to reduce the meaning of *any* to a "quodlibetic application, ranging from the least to the greatest", De Morgan stresses its ambivalent character, expressing either a universal or a particular meaning.

There are several data, which shed some doubts on either of these solutions. The problem is, that in the cases discussed in Vendler (1967), where *any* is licensed by an imperative, *any* fails to map onto a true universal or a simple existential. Second, regarding its syntactic behavior, it is rather surprising that *any*, unlike other universals, is not able to float, even in its free-choice meaning.

- (50) a. I didn't see { all / both / some / any } of them.  
 b. I didn't see them { all / both / \*some / \*any }.  
 c. I can see { all / both / some / any } of them.  
 d. I can see them { all / both / \*some / \*any }.
- (51) a. { All / both / each / some / any } of them can see me.  
 b. They { all / both / each / \*some / \*any } can see me.  
 c. They can { all / both / each / \*some / \*any } see me.

Finally, *any* and its derivatives go well with the post-nominal modifiers *at all* and *whatsoever*, independent of their particular meaning, whereas other operators are not possible with these modifiers (except for the negative indefinite *no*, as shown in (52d)). Notice that (52c) is ambiguous between an existential/NPI interpretation and a free-choice/universal one.

- (52) a. I didn't see {anybody / \*everybody / \*somebody} whatsoever.  
 b. {Anybody / \*everybody / \*somebody} whatsoever can come to the party.  
 c. If {anybody / \*everybody / \*somebody} at all can swim the channel, I can.  
 d. I saw {\*everybody / \*someone / no one} at all.

So, if free-choice *any* is not a universal and the 'ambiguity' between the two *anys* is unwarranted in certain contexts, the question is, what *any* should be regarded as. As indicated in earlier sections, in the last years there is a sort of convergence that *any* is indeed an indefinite in the sense of Heim (1982), with a certain semantic property that

distinguishes it from other quantifiers, as well as from plain indefinite noun phrases. There have been various attempts to identify this property. Starting from Hamilton's notion of 'quodlibetic application', Vendler's notion of a 'blank warranty', we arrive at Kadmon & Landman's (1993) 'domain widening plus strengthening' and Chierchia's (2001) reinterpretation into scalar implicatures. A similar account was given by Tovena & Jayez (1997) in terms of Finian arbitrariness. Horn has proposed in several papers (cf. Lee & Horn 1994, Horn & Lee 1995) that *any* is an indefinite with the additional property that it denotes the end-point of a scale, much in the spirit of Fauconnier (1975b, 1979). The existential use as an NPI would tie it to a quantitative scale, whereas free-choice is associated with a kind scale.<sup>9</sup>

Under the assumption that *any* as an indefinite is equally sensitive to contexts as plain indefinites with respect to its meaning as an existential or a generic, the test case with there insertion can be easily explained: there-insertion never allows for a generic interpretation. Another interesting phenomenon, which has been used to argue for the apparent universal nature of *any* and which appears in a new light now, are exceptive clauses introduced by *but*, *save*, *except* and their analogues. These require a 'universal host', but they are fine with both interpretations of *any*.

- (53) a. {everybody / nobody / \*somebody} but Kim.  
 b. {all / \*most / \*many / \*some / none} of my friends but Chris.
- (54) a. I'll vote for anyone but Bill. (FC any)  
 b. I wouldn't vote for anyone but Bill. (NPI any)

Horn argues that both, FC-*any* as a generic and NPI-*any* as a negative quantifier can be used to convey universal statements. There is some support to this argumentation (cf. Horn 1989:346): *but*-clauses are excluded from ordinary *wh*-questions unless these convey a rhetorical meaning ('*queclaratives*' in the sense of Sadock 1971), expressing negative statements (see 55). In addition, consider *yes/no* questions. I have the feeling that exceptive clauses also reinforce a rhetorical sense to those questions when they contain *any* with an exceptive clause. Otherwise they could be interpreted just as neutral *yes/no* questions.

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<sup>9</sup> The list of contributors to the idea, that *any* is to be regarded "(quasi-univocally) existential/indefinite", given by Horn contains many more. Cf. Jespersen (1933), Bolinger (1960, 1977), Davison (1980), Sommers (1982), Haspelmath (1993, 1997), Jennings (1994), Dayal (1995), Zwarts (1995), Chungmin Lee (1996), Lahiri (1998), or Tovena (1996/98). The various notions employed in order to characterise *any* range from stressing its non-quantificational nature over its function as the endpoint of a pragmatic scale in the sense of Fauconnier to focusing its arbitrary meaning. In order not to lose track with my own presentation of the peculiarities of *any*, I have to omit a detailed discussion of each of these accounts.

- (55) a. #Who but Bill is supporting Al's candidacy?  
 b. Who but Al Gore could have delivered such a boring speech?  
 (→ Nobody but Al Gore...)
- (56) a. Have you seen any owls in the forest?  
 b. Have you seen any owls but sick ones in the forest?

A similar effect can be observed if we consider the contexts presented by Heim (1984) and Linebarger (1980, 1987). Conditionals with *any* can be interpreted rather neutral, but if we add an exceptive clause, they have to be interpreted as counter-factual, or in Linebarger's terms, conveying a negative implicature:

- (57) a. If you drink any water, you'll feel better / you become sick.  
 b. If you drink any water but bottled water, ??you'll feel better / you become sick.

This effect remains a bit mysterious if we maintain Horn's assumption that licensed *any*-sentences always can be used to convey a universal statement. Interestingly, the classic case of free-choice *any*, Vendler's imperatives, goes fine with exceptives. What is puzzling is that these are different from common universals, since in Vendler's terms they provide just the 'blank warranty'.

- (58) a. Pick any card but a red one!  
 b. Any doctor except a homeopathic will tell you that Stopsneeze helps.

Horn also cites cases where an exceptive clause is hosted by *little*. Together with the exceptive this quantifier turns out to receive a scalar meaning, quite close to the meaning of strong NPIS. This must be due to the pragmatic force the exceptive is imposing to the whole construction: whatever the exception is, it is regarded as merely irrelevant to the presented circumstances, therefore the little whatever left gets an interpretation as if there was in fact nothing left. Consider some of Horn's examples from Nexis.

- (59) a. Landowners could do little but accept their fate.  
 b. We are achieving little but the increased and forced evacuation of the ethnic Albanians.  
 c. ... an artful yet provocative cover for her all-Bach CD in which she appears to be wearing little except her violin.

To sum up, exceptive clauses require a complete set as their host. If we consider what it means to introduce an exception to something, this constraint appears to be just natural.<sup>10</sup> In effect, this means that either the whole restriction (universal quantifier) or the reverse, the empty set must be denoted by the hosting noun phrase. As a secondary option this condition can be fulfilled by dealing with conventional implicatures. In (59) a weak quantifier like *little* is forced to be interpreted as a negative quantifier. The sentences are understood as if *little* was augmented by *in fact, nothing*. Notice the increase of universality (cf. Horn 1970), this pertains to suspending the implicature coming along with *little*, a scale reversing quantifier, that there exist at least some referents (e.g., *little but not none*.) With *any* the story is a bit more intricate, since plain generic indefinites tend to resist the acceptability of exceptives:

- (60) a. Any owl {except for/but} a sick one hunts mice.  
 b. ??An owl {except for/but} a sick one hunts mice.

The sentence with the indefinite is not absolutely marginal, but the difference between the two examples seems indisputable. This looks like a serious challenge to the parallelism (or partial identity) between *any* and plain indefinites. But remember that already K&L had to deal with that problem. In their terms, generic indefinites, although involving universal quantification, are ‘domain-vague’. Therefore they cannot be used to denote complete sets. *Any* on the other hand removes this vagueness by domain widening; as a ‘domain-precise quantifier’ it can well be used to convey a universal statement, just as Horn demands for exceptives.

The whole discussion of Horn’s paper should not only be considered as a small detour in order to present the literature and theoretical history of analyses on *any*, but also as an attempt to approach a more thorough analysis of this item. To summarize, one can discern three major theoretical streams to account for the grammatical properties of *any*: 1) the (wide scope) universalist one, which comprises many data problematic under the negative-polarity tradition, but faces severe empirical problems when *any* has undoubtedly an existential meaning. 2) The ambiguitist school tries to split the problem into two: *any* is ambiguous between an existential polarity item and a free-choice item with universal characteristics. In its strong formulation the ambiguity hypothesis has to invoke lexical ambiguity, which is not only unfavorable on theoretical grounds, but also hinders us to look for a general feature of *any*, which would explain the different properties of *any*. And

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<sup>10</sup> Cf. Peter of Spain, *Syntcategorumata*, Tract. IV, 7; de Rijk 1992:171; cited from Horn (2000a): “An exceptive word [e.g., *proeter*] indicates a relationship of a part actually existing in a whole to its whole.”



3) there are attempts to relate *any* directly to the behavior of indefinites, the ‘unequivocal existentialists’, as Horn labels them.

For a brief moment I want to present some comments to the ‘ambiguist’ tradition. A weaker formulation of the ambiguity hypothesis calls for polysemy, relativising the differences to different contexts. Invoking scalar properties, this view on ambiguity looks more like a unified account, anyway. For an example, consider the following sentence, which has available both, an existential and a universal reading for *any*.

- (61) If she can solve any problem, she’ll get a prize.
- a. If there is any problem she can solve... (existential)
  - b. If she can solve every problem... (universal)

Horn & Lee (1995) asking ‘how many *anys*’, as well as Lee & Horn (1994) with their analysis of *any* as containing a covert focus marker ‘even’ strongly suggest that pragmatic scales play a crucial role in the meaning and licensing properties of *any*. Horn cites Haspelmath, who explicates the status of the ambiguity in this sentence as follows: “*Any each time expresses the low endpoint on a scale: the low endpoint of the non-reversed scale in [(61b)] (= ‘the most difficult problem’), and the low endpoint of the non-reversed scale, i.e. the opposite endpoint, in [(61a)] (= ‘the simplest problem’). Thus we can capture both the insight of the univocal universal any theory that the two uses of any are close related, and at the same time account for the ambiguity of sentences like [(61)] which motivated the two-any theory.*” [Haspelmath 1997:117] As correctly pointed out by Horn (2000a) the distinction is not that simple as it looks at first glance: whether *any* is to be interpreted one way or the other in a context that permits both readings, is often disambiguated with a specific prosodic pattern. This observation stems back at least to Jespersen and Bolinger, with the relevant examples cited below:

- (62) a. I can’t do anything (existential = ‘*I can do nothing*’)
- b. I can’t do <sup>˘</sup>ANYthing (universal = ‘*There are some things which I can’t do*’)  
[“pronounced emphatically with ... falling-rising intonation,” Jespersen 1933, §17.92]

- (63) a. I don’t want to go anywhere
- b. I don’t want to go <sup>˘</sup>ANYwhere  
[“with fall-rise pitch accent on the last word, meaning ‘*I don’t want to go just anywhere,*’”  
Bolinger 1960, p. 379]

On first sight, one could argue that whatever the role of intonation exactly is, it should be clear that in those cases where *any* receives emphatic stress, *any* is a scalar item by virtue of focus. This argumentation, would directly give support to Lee & Horn’s *any*=indefinite+*even* analysis, but also to Kadmon & Landman’s obligatory widening+

strengthening. However, when we look closer at the semantics of the (b-) examples above, we see that what is in focus (and also in the scope of contrastive negation) is only the free-choice property of *any* (directly indicated in Bolinger's paraphrase with just anywhere; cf. also Laka 1990 who promotes insertability of just as a diagnostic for free-choice *any*.) Hence, the relation between *any* and negation as its potential license is just the opposite from the regular NPI cases: whereas scalar NPis depend on the assumption that the relevant sub-formula must also be true of all alternatives (higher members on some pragmatic scale), contrastive focus explicitly renders all potential alternatives with the opposite truth value than the element in focus. In the cases above, the sentence means that there are 'some things which I cannot do'. But actually, by virtue of the meaning of contrastive focus, the sentences also express that 'there are some things which I can do'.

But this meaning could also be derived if free-choice *any* were just another type of universal quantification: under a DE, hence scale reversing expression like negation, the sentences with free-choice *any* would give rise to a secondary scalar implicature with a lower element on that scale, such as *some*. And it could also be argued that contrastive focus just triggers this implicature. While this is certainly a reasonable point, the meanings of free-choice *any* and universal quantifiers like every differ from each other in important respects, as already brought to attention by Vendler. Horn gives another example, showing that this differences also show up under negation. Consider the following paradigm:

- (64) a. I wouldn't marry anyone (renounces connubiality)  
 b. I wouldn't marry everyone (renounces polygamy)  
 c. I wouldn't marry just anyone (renounces indiscrimacy)

This example is particularly interesting since a predicate like marry is rather incompatible with a distributive interpretation of a universal. Perhaps the modality of the sentences obscures the right interpretation a bit, but negating a true universal quantifier (64b) aims at a reading where the sentence is an advice not to marry all the candidates, whereas the free-choice interpretation of *any* (64c) just negates the 'no matter which'-property expressed by *any*, and does not give rise to any reading where plurality of weddings is understood.

This brings us back to the third stream of analyses for *any*, the 'unequivocal existentialists'. Under the present perspective, these accounts are not so far anymore from the second one (the 'ambiguists'). At least in the sense that authors subscribing to the 'existentialist' tradition would not stress the 'existential' interpretation of *any*, but rather its parallelism to plain indefinites. Clearly, indefinite noun phrases also do not always receive an existential interpretation. But the pertaining question is what property of *any* makes the crucial difference to indefinites. In the next section I propose an analysis based on the rather simple assumption that Vendler's description is most accurate. What has to be provided in addition is an integration into current theories of grammar.

## 2.2. Approaching a unified account for ‘any’

While discussing Horn’s paper in the last section, laying out the different schools of thought about *any*, it became obvious that a theory, which accounts for the peculiar behavior of *any* in a uniform way, is clearly the favorable one over an account that has to tell a different story for each of the two sides of the meaning of *any*. In a syntactic sense, *any* is a determiner, just as the indefinite article or any other quantificational determiner. One criteria clearly is the complementary distribution to the indefinite article. It displays differences and similarities to both, the indefinite article and other quantifiers. A rough characterization of its meaning would state that the referents of the associated noun phrase cannot be specified, neither in quantity nor in quality. This corresponds largely to the notions we have encountered already: ‘arbitrariness’ (Tovena & Jayez 1997, Tovena 1998), ‘quodlibetic’ (Hamilton 1858), ‘freedom of choice’/‘indifference of size’ (Vendler 1967), ‘distribution indicator’ (Sommers 1982), or ‘arbitrary and disjunctive choice’ (Chungmin Lee 1996) or ‘contextual vagueness’ (Dayal 1998). Before going into more detail, let us make a short detour and begin with some speculative remarks on the diachronic development of this item, which lives very naturally in the English language, but is not so widespread among languages, at least not with precisely identical properties.

### 2.2.1. German ‘einige’: a different kin.

It seems quite plausible that *any* in English morphologically has a similar diachronic base as its German kin *einig(e)*.<sup>11</sup> It is made up from the weakened numeral one, which in turn mutated into the indefinite article in both languages, plus a derivative suffix, which is normally used to create adjectives. In German *einig(e)* means ‘some, several’ and is used only with plural or abstract/mass singular nouns, and its contribution is both to mark that the number or amount is deliberately unspecified, and to emphasise that a relevant quantity is involved. The first part is a weaker requirement, in that it does not entail indifference, in principle, the quantity could be specified. It is plausible to assume that *any* in Old English originally had exactly this meaning. In the course of diachronic development a shift of meaning took place: the property of not being specified did not only apply to quantification of number or amount, but was proliferated also to quality. As a consequence it became possible to use it also with singular count nouns, however, at that stage it must have

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<sup>11</sup> Hamilton (1858: 615) argues similarly, comparing *any* with a morphologically similar item in Latin: “Our English ‘any’ (*aenig, anig, Ang.-Sax.*) is of similar origin and signification with the Latin ‘ullus’ (*unulus*), and means, primarily and literally (*even*) one, even the least or fewest. But now ... it is of quodlibetic application, ranging from the least to greatest; and (to say nothing of extra-logical modes of speech, as interrogation, doubt, conditioning, extenuation, intension, etc.) is exclusively adapted to negation.” [Cited from Horn (2000a).]

already developed its ‘polarity sensitive’ behavior. Notice that the property of ‘deliberately unspecified’ also changed to ‘indifference’. A crucial factor seems to be sensitivity towards downward entailing operators and negation. When this factor came into play and whether it was a trigger or a consequence of this (at the present stage of investigation) hypothetical development is an open question. A synchronic comparison between English *any* and its German kin *einig(e)* may not help to decide, but can shed some light on a possible analysis. Crucially, *einig(e)* in German, although it can be used with singular mass or abstract nouns, it definitely cannot occur with singular count nouns. A prerequisite to using *einige* with a singular noun is that the amount of what the noun-phrase denotes must be gradeable. With mass nouns, normally any non-specific quantity can be graded, with abstract nouns this is not always the case (65d):

- (65) a. Gestern haben wir einige Bars/\*Bar besucht.  
           ‘Yesterday we have visited several bars.’
- b. Gestern haben wir einige Biere/?einiges Bier getrunken.  
           ‘Yesterday we have had several beers/quite some beer.’
- c. Ich habe einige Lust, noch eines zu trinken.  
           ‘I am in favor of having another one.’
- d. ??Er hat einige Fixierung, Bier trinken zu gehen.  
           ‘He has some fixation to go for a beer.’

*Einige* may in principle occur in DE contexts, but it carries along an existential presupposition, so with clause-mate negation it enforces a meta-linguistic interpretation of negation, or has to be interpreted with wide scope over negation, which is reminiscent of the behavior of *some* in English. Remember that *some* has to take wide scope over clause-mate negation in order to receive an appropriate interpretation, but unlike *some*, the quantificational expressions *einige/several* seem to lack the possibility of rescuing their narrow scope interpretation when a DE operator scopes over the whole clause (cf. Szabolczi 2002a).

- (66) a. Jeder, der einige Biere getrunken hat, ist irgendwann betrunken.  
           ‘Everybody who drank several beers will be drunk at some time.’
- b. %Höchstens 3 Studenten haben gestern einige Biere getrunken.  
           %‘Yesterday at most 3 students had several beers.’
- c. %Niemand hat gestern einige Biere getrunken.  
           %‘Yesterday no one had several beers.’

- (67) a. %Ich bezweifle, dass gestern niemand einige Biere getrunken hat.  
           ‘*I doubt that yesterday no one had several beers.*’
- b. I doubt that no one had some beers yesterday.

If *einige* N is in the scope of a DE operator like the restriction of a universal quantifier (66a), nothing much happens. Delimiting operators (*at most*) or negation proper require that the phrase containing *einige* is interpreted independent of the DE operator, or, in case of negation, that the negation is interpreted meta-linguistically, such as a denial of a previous statement. (66c) presupposes a context that there were certain students drinking several beers and expresses that this context is actually false. In (66b) it seems that only a certain amount of beers (relevant for the discourse) is presupposed and the focus of the assertion lies on the number of students who took part in the (heavy) drinking event.

Let us finish this small excursion with another example where the readings just discussed come about even more clearly. This may be due to the fact that it is easier to reconstruct a certain amount of books the students were supposed to read (as an assignment for example) rather than presupposing relevant amounts of beers. Both of the two following sentences assert a restriction on the set of students who fulfilled the requirements. In the second example, this set is clearly empty, hence we get the interpretation as a denial.

- (68) a. %Höchstens 3 Studenten haben einige Bücher gelesen.  
           ‘*At most 3 students read several books.*’
- b. %Niemand / kein Student hat einige Bücher gelesen.  
           ‘*Nobody / no student read several books.*’

It is interesting to note that these example differ from wide-scope indefinites in one crucial aspect: while indefinites (for example *some*) can receive a specific interpretation, meaning that they have a fixed denotation independent of the DE operator occurring in the sentence, (or – in other terms – presupposing the existence of a certain referent whose identity is not revealed in the discourse), the sentences in (68) only presuppose a certain low threshold on amounts of books the students should have read, hence the existence of some quantity. There is no specific set of books implied in these sentences, and the actual amount may vary from student to student, provided it fulfils the relevance criterion introduced by *einige*. Given the potential variance in (68a) we must not conclude that the phrase with *einige* simply takes wide scope over the DE subject. (Concerning the German data, such an assumption would be controversial anyway, since there is a strong preference to read off the scope of quantifiers from the surface, at least when an unmarked word order is involved.) On the other hand, the real wide scope reading is actually available if we topicalise the phrase with *einige*:

- (69) Einige Bücher haben höchstens 3 Studenten gelesen.  
 some books-ACC have at most 3 students-NOM read  
 ‘For some books it is the case that at most 3 students read them.’

Here not a certain quantity is presupposed, but actually a specific set of books (of a certain relevant quantity). This is what is expected due to the topic function the phrase with *einige*, while the subject receives focus. The interpretation as a denial (or a refinement of the amount of students involved in the situation) disappears.

To sum up, German *einige* is similar to *any* in English in that both are unspecific with respect to quantity and reference. But *einige* does not share the properties of *any* in that it is neither sensitive to DE contexts (on the contrary, due to its existential presupposition it rather avoids them), nor does it require certain other licensing contexts.

### 2.2.2. The meaning of ‘any’

If we hypothesize that *any* originally indicated the same non-specification of a certain quantity as *einige* in German does, the meaning of *any* (now really!) could be described in the following terms. While retaining its function as a quantifier, diachronically it lost all of its substantial meaning, its semantic contribution to the interpretation of the noun phrase is completely “bleached out”. Syntactically, it still occupies the position of the determiner, and semantically it has to be treated with quantificational force, but which? What it does first is that the associated noun phrase can no longer be regarded as a free variable, in the sense of Heim (1982). Therefore it cannot be bound by other operators such as universal quantifiers, or licensed by existential closure at various levels of syntactic/semantic structure. It maps the meaning of the noun phrase, which consists of a bare property and a specification for number onto all possible extensions compatible with the property expressed by the noun itself. This explains why we lack any contextual restriction, which corresponds to K&L’s formulation that *any* expresses the removal of salient restrictions inherent to indefinites, hence a widening of its denotation. Here, there is no widening as a process, it is the vanilla interpretation of the part of a nominal structure which consists of the number feature plus a common noun (predicate). The contextual restriction we perceive with plain indefinites comes in addition, in fact it is part of the procedure we know as existential closure, or it may be derived from the restrictions coming along with other operators binding the indefinite. This is, how the universal flavor comes about, but it is a result of the fact that we are not in a situation where we may make a choice upon a certain referent or sets of referents. In a way, what I have formulated right now can be regarded as a preamble to Krifka’s (1995) treatment of *any* expressing the most general property. What is crucial is that negation acts upon *any* as it does on every other quantificational expression. Nevertheless, *any*-phrases do not act as interveners just as non-scalar *many*, or

indefinites, so we expect one negation to license an infinite number of (weak) NPIS like *any*. This prediction seems to be borne out. Unless *any* is emphatically focussed, which indicates a denial of indifference, we do find recursive licensing.

- (70) a. Peter didn't give any books to any student.  
 b. \*Peter didn't give (just) ANY book to any student (but Syntactic Structures).

The quantificational force, as we see, is rather exempt as far as individuals are concerned, however, *any* implicitly quantifies over situations where the assignment of the intensional meaning to actual extensions could apply. This, and here I agree with Dayal (1998) is why a simple declarative statement with *any* in it is taken to be inappropriate. Citing from her paper: "*What distinguishes any [from other quantifiers], I claim, is that it quantifies over possible individuals. This is captured here by the universal quantifier binding the situation index on the common noun. The nucleus asserts that these situations extend into situations that verify the matrix predicate.*" [Dayal 1998: 20, emphasis added]. To see, how this works, let us consider a generic context first.

- (71) a. Any owl hunts mice.  
 b.  $\forall s,x [\text{owl}(s,x) \ \& \ C(s)]$  [GEN  $s'$  [ $s < s'$  &  $C'(s')$ ]]  $\exists y$  [ $\text{mice}(y,s') \ \& \ \text{hunt}(x,y,s')$ ]]  
 [Dayal 1998, ex. 34]

The crucial part of this formula is that the situation index associated with the universal operator expressing the freedom to make whatever choice, has to be able to extend into the situations where generically an owl hunts mice, which is not a problem. However, if we have an episodic statement, this is no longer possible:

- (72) a. Yesterday John talked to any woman.  
 b.  $\forall s,x [\text{woman}(s,x) \ \& \ C(s)] \exists s'$  [ $s < s'$  &  $\text{yesterday}(s') \ \& \ \text{talk}(j,x,s')$ ]  
 [Dayal 1998, ex. 42]

The tense-aspect of the main clause is episodic, this means that there will not be two tripartite structures, but only the one associated with *any*. The situation variable of the main predicate is existentially closed, and temporally bound within the interval denoted by the adverbial. Dayal's explanation for the inacceptability of such a sentence is that "(72) [orig.: 42b] says that all possible woman situations extend to a situation located at a particular interval, namely yesterday. Now, clearly, there will be many situations that will render the statement false, for example, all those women situations that do not overlap with John's existence. There is something infelicitous in making a statement that is doomed to be false." [Dayal 1998:25f] Now we are in a situation to tackle the subtriggering effect attributed to LeGrand (1975). It amounts to the fact that *any* is appropriate even in episodic

statements, provided that the noun phrase headed by *any* is restricted in a way, that this restriction can be taken to express a substantial property (in contrast to accidental restrictions). Dayal discusses this distinction extensively, which I spare here, since we see immediately how it comes about. Take the following:

- (73) a. Yesterday John talked to any woman he saw.  
 b.  $\forall s, x$  [woman(s,x) & C(s) &  $\exists s''$  [s<s'' & yesterday(s'') & see(j,x,s'')]]  
 $\exists s'$  [s<s' & yesterday(s') & talk(j,x,s')] [Dayal 1998, ex. 43]

The trick of subtriggered *any* phrases is that the situation variable first has to extend into situations where John saw some woman, hence we immediately can restrict our set of situations where a woman is involved. The second extension (within the nuclear scope of the universal associated with *any*) can then be easily fulfilled, it only has to be the case that whenever John saw a woman, he started to talk with her, and this is what the sentence expresses. Only if the restrictive relative clause is not accidental, the additional restriction, which makes *any*'s life possible here, will be mapped into the restriction of the universal. Hence we also get the confinement to substantial restrictions.

With that machinery, Dayal is in a situation to explain why a great number of contexts, normally attributed to the free-choice use of *any*, give grammatical results: the extension of situations where women, or whatever the noun phrase denotes, are involved to situations where the main predicate gives a true statement is possible for all of these situations, hence our universal quantification can be fulfilled. Just for completeness, compare epistemic possibility versus necessity:

- (74) a. Any pilot could be flying this plane.  
 b.  $\forall s, x$  [pilot(x,s) & C(s)]  $\exists s'$  [s<s' &  $\diamond$ fly(x,p,s')] [Dayal 1998, ex. 53]
- (75) a. \*Any pilot must be flying this plane.  
 b.  $\forall s, x$  [pilot(x,s) & C(s)]  $\exists s'$  [s<s' &  $\bullet$  fly(x,p,s')] [Dayal 1998, ex. 54]

Regardless of the detailed version of a theory of epistemic possibility or necessity, there is common agreement that the former involves existential quantification over accessible worlds, whereas the latter involves universal quantification. The semantic formulas in the above examples then read as “*there is an s' which is part of some* [or every in the latter example] *accessible world &  $\phi$*  [the formula in the scope of the modal operator] *holds at s'.*” [Dayal 1998: 31] Whereas it is possible to conceive for every possible situation where there is some pilot or other involved a possible extension where the pilot is the one flying the plane, the sentence with epistemic necessity would result in an interpretation where all possible pilots would be the pilot of the same plane, which is clearly incompatible with our



knowledge about the world. Just for illustration, the situation changes when the object is a bare indefinite, since now in every accessible world there must be a pilot flying some plane, but each of them has its own plane.

- (76) a. Any pilot must be out flying planes today.  
 b.  $\forall s,x [\text{pilot}(x,s) \ \& \ C(s)] \ \exists s'[s < s' \ \& \ \bullet \ \exists y[\text{plane}(y) \ \& \ \text{fly}(x,y,s')]]$   
 [Dayal 1998, ex. 55]

For further details, the reader is referred to the original text, but there is one point being very important. Dayal asks whether the same analysis can be carried over to polarity sensitive *any*, and gives a negative answer. The crucial data are given below

- (77) a. If anyone can solve this problem, Bill can.  
 b.  $(\forall s,x [\text{person}(x,s)] \ [\diamond\text{solve}(x,p_i,s)]) \ (\exists s'[s < s' \ \& \ \diamond\text{solve}(b,p_i,s')]) \ \textit{narrow} \ \forall$   
 “If it is the case that any (every) person can solve this problem, then it follows that Bill can.”  
 c.  $\forall s,x [\text{person}(x,s)] \ [(\diamond\text{solve}(x,p_i,s)) \ (\exists s'[s < s' \ \& \ \diamond\text{solve}(b,p_i,s')])] \ \textit{wide} \ \forall$   
 “For any (every) person x, if it is the case that x can solve this problem then Bill can.”  
 d.  $\forall s \ (\exists x[\text{person}(x,s) \ \& \ \diamond\text{solve}(x,p_i,s)]) \ (\exists s'[s < s' \ \& \ \diamond\text{solve}(b,p_i,s')]) \ \textit{narrow} \ \exists$ .  
 “If it is the case that there is any (some) person who can solve this person, then Bill can.”  
 [Dayal 1998, ex. 76]

On the first reading, there is an implicature that Bill is not particularly smart, deriving from the interpretation of the antecedent that the problem is such that everybody can solve it. The second reading has the implicature that Bill is the smartest individual, since for all persons under discussion, and not only some subset of persons, Bill still is capable of solving this problem. This reading can be derived in two ways (77c,d). (77c) would treat free-choice and polarity sensitive *any* alike, and thus conform to LeGrand’s original analysis. However, modification with almost/absolutely is only warranted with free-choice *any*, and it would be a mystery, why this difference would exist, if the two *anys* would just be discerned in terms of scope with respect to the conditional. Dayal takes these data as evidence that there must be two distinct lexical items for *any*, one coming along with a universal quantifier, and one that is existential, their common core of meaning being that both are ‘contextually vague’. (In a more recent paper (2004) she gives a more detailed account on this notion closer related to alternative semantics.)

However, I think that there is a way out of this dilemma, while still retaining the idea that there is just one *any*. Notice that the free-choice interpretation is definitely favored, when *any* is emphatically focused. This gives us a hint why the free-choice interpretation

of *any* must correspond to the narrow scope reading. I would like to propose that in these cases the projection of alternatives is bounded within the antecedent clause itself. *Any* is still licensed, since, and here I think Dayal slightly misrepresented the data, the extension of situations where some person is involved into situations, where this person can solve the problem is also confined to the protaxis of the conditional. This must be the case, since the antecedent clause in isolation conforms to a valid constellation for free choice *any*. I agree with her, too, that the wide scope representation must be wrong on conceptual grounds (island violation being the least, but normally universals do not leave their clausal domain at all.) However, the representation with a narrow scope existential does not substantially differ from what we have proposed as the semantics of *any*. We did not claim that *any* is a universal per se, only that it carries along a universal operation upon situations where a referent for the *any* phrase might be picked. If this universal operator is not disrupted by for example negation, or mapped onto a universal operator with clausal scope, as can be argued to be involved in conditionals, then we get an interpretation that intimately resembles regular universal quantification, in that the universal operator not only directly binds the situation variable, but also the variable corresponding to individual reference.

Polarity sensitive *any* in a conditional takes the conditional operator itself for binding the situation variable, it doesn't have to move it there. One prerequisite to do so is that it is not contrastively focused, which would create an independent domain of evaluation. Existential closure on the other hand, is an illusion, since the individual reference variable is still bound by the universal operator. With negation itself the picture is quite similar. *Any* may well carry along its universal quantification over situation/individual pairs. The situation variable of the main predicate is bound by negation, so extension of *any*'s situations into an empty set of situations is not really problematic.

As also noted by Dayal, under this perspective, where domain widening does not play a principal role, but can be derived from the core meaning of *any* in cases where it actually obtains, we can overcome a problem most adherent to K&L's proposal. In particular this concerns the question what happens to domain widening if the domain itself is explicitly fixed. This is the case with definite partitive restrictions of the noun phrase headed by *any*. The following sentences appear to have exactly the same truth conditions, but given that the extension of both noun phrases is fixed, definitely no widening in the sense of K&L can take place.

- (78) a. If you press one of these three buttons a red light will flash.  
 b. If you press any of these three buttons a red light will flash.

The contribution of *any* in the second sentence is just to emphasize 'no matter which', but no salient properties are involved that would or would not restrict the denotation. Since the antecedent clause is not modal itself, the evaluation domain has to extend up to the

conditional in order to avoid the inapt extensions of situations associated with the denotation of the noun phrase. That the possible choices of referents are limited to just three buttons need not concern us any longer.

In the remainder of this chapter I will present a small excursion on a topic, which is rarely addressed: why do comparatives license weak NPIS and why don't they license strong NPIS? Especially interesting is the fact, noticed in Schwarzschild & Wilkinson (2002), that while weak NPIS clearly are of the existential/polarity sensitive type (there is no real free-choice interpretation for *ever* and *any* obeys the diagnostics for existential *any*), the interpretation still conveys a universal meaning: 'he is taller than anyone else in his class.'

### 2.3. Comparatives and weak NPIS

As we have proposed before, and following Vendler (1967), Dayal (1998, 2005) and an old intuition of myself, weak NPIS in fact involve some kind of universal meaning. However, they lack encoding for definiteness or specificity, hence their closeness to plain indefinites and the difference to real universal quantifiers like *every* or *always*.

One source of intuition comes from German. In this language there is no direct counterpart to *any* in English, but a temporal adverbial '*jemals*' seems to behave exactly like *ever* (cf. Neubarth 1995).<sup>12</sup> However, this German kin to *ever* is morphologically much more transparent: it is made up of *je* and (optionally, since it can be used alone as well) the Genitive form of *Mal*. (*Mal* is roughly translated 'time(s)' in English in phrases like '3 times'. E.g., *einmal* = 'once', *dreimal* = '3 times'). *Je* by itself is ambiguous. It can mean '*jemals*', but then it must be accented. Or it has a clear distributive meaning and stands for *jeweils*, which conveys a meaning very similar to (floated/stranded) *each* in English. *Je(jeweils)* demands a plural antecedent, which can be the subject (79b,c) or a preceding object, and it distributes over another indefinite argument or over events (79c).

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<sup>12</sup> This is not exactly the case: in compounds *ever* may be used with as a real universal, e.g., "everlasting smile" and it is also used to form a special class of pronouns introducing free relatives, e.g., *whoever*, *whatever*,... On the other hand, German *jemals* lost its visible status as a universal not so long ago as one would expect.

- (79) a. Peter hat den Kindern je(weils) ein Buch geschenkt.  
Peter has the children JE a book given  
*'Peter has given the children a book each.'*
- b. Die Kinder haben je(weils) 2 Kekse gegessen.  
the children have JE 2 cookies eaten'  
*'The children each have eaten 2 cookies.'*
- c. Die Kinder sind jeweils zu sich nach Hause gegangen.  
the children have JE to themselves home gone  
*'The children each went to their home.'*

That NPI *jemals* is no plain indefinite plus some polarity feature, but rather an unorthodox covert distributive universal ranging over potential situations to be evaluated can be demonstrated with comparatives. Comparatives constitute one of the core licensing environments for NPis like *any* or *ever* is a fact that is already mentioned in Klima (1964).<sup>13</sup>

- (80) a. Peter ist klüger als je(mals) zuvor.  
b. Peter is smarter than ever (before).
- (81) a. Peter is taller than anyone else in his class.  
b. Peter read more books than anyone else in his class.

Superficially, comparatives could be tied to negation by assuming a covert negation in the complement of the comparative predicate. (E.g., *John is taller than Bill* → *Bill is not as tall as John*.) But even Linebarger's indirect licensing would have problems with such an implementation, since what we are dealing with here is logical entailment and not implicature.<sup>14</sup> Remember that negative implicatures in Linebarger's model had to strengthen the proposition, exactly to exclude certain entailment relation such as double negation from being an appropriate licenser for NPis.

It seems to me more appropriate first to consider the assumptions we want to make about comparatives in general.<sup>15</sup> For the moment, let us simply assume that they involve some kind of abstraction over a certain dimension which is provided by the (gradable)

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<sup>13</sup> See also Hoeksema (1983), Stechow (1984) for early analyses.

<sup>14</sup> This – entailment rather than implicature – can be tied to the scalar nature of gradable adjectives and more particular comparatives. However, at this point I will not elaborate on the relevant difference any further, since it will come clear from the following discussion.

<sup>15</sup> I will not provide a full argumentation for all of these assumptions. For a more thorough discussion, cf. recently Heim (2000), Kennedy (1997, 2001b), Lechner (2001), Rullmann (1995), Schwarzschild & Wilkinson (2002).

adjective, and that comparison is performed over degrees along that dimension.<sup>16</sup> Adjectives are two-place predicates, their first argument can be regarded as the “subject”, the second a potentially covert measure, or, in semantic terms, a function from objects to degrees. In the ungraded form, when the measure is not overtly expressed, one may assume that the degree is interpreted as (or minimally above) a contextually determined standard. A basic semantic representation would look like the following (adapted from Heim 2001):

$$(82) \quad \parallel \text{ADJ} \parallel = \lambda d_{\langle d \rangle} . \lambda x_{\langle e \rangle} . x \text{ is ADJ' to degree } d$$

Two interesting observations show that our view is blurred already when we talk about measure arguments and degrees simultaneously. Degrees are abstract values (or intervals) positioned on scales along a certain dimension. They are calculated and understood with the meaning of a gradable adjective. What is crucial about these dimensions is that they are monotone, and therefore establish scales. The points on these scales need not conform to physical or numerically expressible measurements. (For example it would be hard to define physical measures for rather abstract properties like strength, cleverness or beauty.)<sup>17</sup> Measures (overt or covert) on the other hand can be understood as providing relative or absolute values; and if they are to be realised overtly, they are expressed by the second argument of a gradable adjective. In the light of this distinction, the semantic representation in (82) is a bit misleading: the degree as part of the meaning of the adjective is treated as if it were the measure argument of the adjective. That this cannot be the case will come clear immediately once we discuss comparatives. Let us consider a more concrete example:

- (83) a. Peter ist 178 cm gross.  
       ‘Peter is 178 cm tall’  
       b.  $\parallel \text{tall (Peter)(178cm)} \parallel = \lambda d . \lambda x . (x \text{ is tall to degree } d)(178\text{cm})(\text{Peter})$

Here the measure phrase ‘178cm’ is identical to the degree, and the measure is interpreted as an absolute value. However, this does not come out from the representation we have given so far. Let us try to make sense of the assumption that degrees are abstract and only interpretable with respect to a contextually given dimension. Then the meaning of the adjective translates into a dimension with a degree, and the measure argument is subsumed in the calculation the degree enters. A first approximation would look as follows:

<sup>16</sup> Cf. Bartsch & Vennemann (1973), Cresswell (1976), Russell (1905), Stechow (1984), Williams (1977) for semantic treatments of gradable adjectives which involve (abstract) degrees.

<sup>17</sup> The distinction alluded to here was made by Bierwisch (1987), who discerns between *dimensional* and *evaluative* gradable adjectives.

$$(84) \quad \|\text{ADJ}(x)(m)\| = \exists d. \lambda d \lambda x (\text{DIM}_{\text{ADJ}}(d)(x)) \wedge (d = m)^{18}$$

where ADJ' translates into  $\text{DIM}_{\text{ADJ}}(d)$  (e.g.,  $\|\text{big}(x)\| = \|\text{size}(d)(x)\|$ , and  $m$ , the measure argument of the adjective is computed with respect to the degree argument of the dimension (as identity).

The second observation is that many adjectives have a negative counterpart to a positive one, e.g., *tall/big* vs. *small*, *easy* vs. *difficult*, *good* vs. *bad*, which can be regarded as antonyms. According to our intuition over relations between objects, only the positive expression of these pairs is appropriate with measure phrases denoting absolute degrees, i.e. when the object under discussion is regarded as relatively *high/tall* etc..

- (85) a. Der Wiener Stephansdom ist 137m hoch.  
       ‘*The Viennese St. Stephens Cathedral is 137 m high.*’  
 b. %Der Wiener Stephansdom ist 137m niedrig.  
       %‘*The Viennese St. Stephens Cathedral is 137m small.*’

I think that this effect can be explained as follows.<sup>19</sup> The measure argument can only be interpreted when a certain dimension is established, which provides degrees ordered on a scale. The ordering relation on that scale is upwards with positive adjectives and reversed with negative ones. (This only holds if the adjective under consideration is taken to be a negative gradable adjective: one could imagine a scale of *smallness* as opposed to *vertical size*, but then the measure in meters would not be appropriate, to my intuition.) However, this reverted perspective on a given scale must be pragmatically available. The reason why sentence (85b) is odd lies exactly there: it is odd to conceive the dimension *vertical size* as being ordered from higher degrees to lower ones. When we take a different scale, such as *areal size*, it seems to make sense to assume that both orderings are available. The following pair of sentences seems to support this view:

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<sup>18</sup> In order to make the similarity between ungraded forms and comparatives even more contingent, a possibility would be to use the measure argument as an add-on to the degrees (relativised toward the entailment direction of the associated scale). Then the equality predicate would have a semantics like  $(d = d_0 + m)$ , whereas  $d_0$  is in fact zero. This option would have the benefit that the meaning of the adjective is always the same: it has one external and a facultative internal measure argument. The rest is construction specific: equatives, comparatives, and superlatives have a similar semantics:  $d$  is in a certain relation to  $(d' + m)$ . Depending on the ordering relation of the scale (or dimension)  $m$  can be conceived of as having negative values as well. The relation itself is construction specific: ‘=’ with equatives, ‘>’ or ‘≥’ with comparatives etc., also the selection of the appropriate  $d'$  depends on the context: in ungraded predicative constructions  $d'$  is 0.

<sup>19</sup> See also von Stechow (1984), Bierwisch (1987), Kennedy & McNally (2005).

- (86) a. Das Klo ist einen halben Quadratmeter gross.  
           ‘*The bathroom is half a squaremeter big.*’  
       b. ?Das Klo ist einen halben Quadratmeter klein.  
           ‘*The bathroom is half a squaremeter small.*’

Returning to the first observation, that degrees and measures must not be regarded as identical, we may now turn to comparatives. The internal measure argument of an adjective is translated into absolute degrees in the ungraded form of the adjective. However, it refers to the difference between two degrees in the comparative. Hence, the measure argument refers to a relative value.

- (87) a. Peter is 178 cm gross.  
           ‘*Peter is 178 cm tall.*’  
       b. Peter ist (um) 3 cm grösser als Maria.  
           ‘*Peter is 3 cm taller than Mary.*’

It is standardly assumed that the comparative argument, clausal or phrasal, is subordinated to the comparative adjective predicate.<sup>20</sup> Lechner (1999, 2001) shows that the distinction between sub- and co-ordination can and must be relaxed with respect to comparatives in order to account for reduced/phrasal comparatives without the stipulation of construction specific ellipsis strategies. In particular, he shows extensively that general strategies for conjunction reduction such as gapping, right-node raising and ATB extraction can fully account for the realm of empirical data. Here, I furthermore assume a strict decomposition of the comparative predicate and the involved adjective, in addition to the decomposition of gradable adjectives into a diadic dimension predicate. Abstracting away from tricky matters of quantification over the arguments of the comparative (e.g., plural or collective antecedents etc.), and also the embedding of the comparative and its arguments into the syntactic and semantic structure, a rough approximation to the LF of comparatives would be:

$$(88) \quad \|\text{COMP}(\text{ADJ}(x)(m))(Y)\| = \exists d: \text{DIM}_{\text{ADJ}}(d)(x) \wedge^{21} \\ (\forall y.y \in Y: \exists d': \text{DIM}_{\text{ADJ}}(d')(y) \wedge d \geq d' + m)$$

where ADJ translates into  $\text{DIM}_{\text{ADJ}}(d)$  (e.g.,  $\|\text{big}(x)\| = \|\text{size}(d)(x)\|$  “*x has size of degree d*”), with a presupposed ordering  $d > d'$ , and Y is the set of elements which take part in the comparison; and m, the measure argument of the adjective is computed with respect to the degree argument of the dimension associated with the comparatum.

<sup>20</sup> See for example Kennedy (1997), Stechow (1984).

<sup>21</sup> Notice that in the notation proposed here, the first and the second clause are connected by ‘ $\wedge$ ’, thus indicating already the proximity to proper syntactic coordination.

The proposed ordering as a presuppositional part of the meaning of the comparative is not reverted under clausal negation, this seems to indicate that it is in fact presupposed, much in the sense of Horn's treatment of scalar presuppositions. Another problem concerns the measure argument of the adjective (m), which seems to gain a life more as a co-argument of the comparison predicate rather than directly expressing the degree of the adjective.<sup>22</sup> And finally, if (m) is not overtly expressed, it has to be assumed that it is still there as an implicit argument with a contextually relevant value. Otherwise the comparison relation would have to be replaced by '>' instead of '≥', which would be an undesired move. But I think it makes sense to bring in pragmatics from that side: if we were to utter a proposition 'A is taller than B', with the premise that A and B are human beings, this statement would not be felicitous if A were only 0.003 millimeters taller than B. Things, however, would change drastically if we were to compare different molecules for example.

Second, we see that it is not the adjective itself, which is copied into the (in the relevant cases) elliptic comparative clause, but the dimension with its degree variable. The presupposition is that the degree associated with the set of elements of the comparison is lower on the scale than the degree of the antecedent. Notice that the comparative clause may contain even a different adjective, provided that the two adjectives share identical dimensions (cf. von Stechow 1984, Bierwisch 1987, Kennedy 2001a).

- (89) Der Tisch ist breiter als die Türe hoch ist.  
'The table is wider than the door is high.'

Here, the dimension could be characterized as a one-dimensional linear extension. There is one part of the meaning of the respective adjectives, which does not enter the comparative: orientation. While the adjective in the main clause, which carries along the comparative morphology, indicates horizontal orientation, the adjective in the comparative *als/than*-clause indicates vertical orientation. I think this is an argument in favor of the decomposition analysis I have sketched so far. It also has the advantage of not invoking negation per se as part of the meaning of comparatives, which – in the light of NPI phenomena – gives us the desired result that strong NPIS should resist comparatives as licensing contexts, which is exactly the case:

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<sup>22</sup> There is one exception where the measure seems to directly represent a degree in a comparative construction: when the measure is the only remaining constituent of the elliptical comparative clause (i.). However, I think this directly relates to comparative ellipsis, and the measure is not an argument of the comparative adjective (iii.).

- i. Peter is taller than 178 cm.
- ii. Peter is taller than ~~if he were~~ 178cm tall.
- iii. %Peter is 178 cm taller.



- (90) a. Peter is taller than anyone else in his class.  
 b. ??Peter is taller than even a single class-mate.

More has to be said about the comparison relation itself. It takes two arguments of type *d*, both of which must be associated with the same dimension/scale. The scalar characteristics is brought in by the ordering relation, but this ordering may be reverted with negative adjectives. Consider the semantic representation of *smaller*.

- (91)  $\| \textit{smaller}(x)(m)(Y) \| = \exists d: \textit{size}(x)(d) \wedge (\forall y.y \in Y: \exists d'. \textit{size}(y)(d') \wedge d \leq d' - m)$   
 where  $\textit{small} = \textit{size}(d)$ , with a presupposed ordering  $d < d'$ , and *Y* is the set of elements which take part in the comparison, and *m*, the measure argument of the adjective is computed with respect to the degree argument of the dimension associated with the comparatum.

Everything seems to be tied to the monotonicity property of gradable adjectives. The way the measure argument is linked with the associated degree seems to obey the principle of increased informativity, thus being sensitive to scale reversal.

What I have avoided is to introduce the maximization function. (Cf. von Stechow 1984, Rullmann 1995, Heim 2001, Kennedy 2001a, 2004, among others.) Whereas it may make sense in cases where degrees have to be regarded as intervals (cf. Seuren 1984, Bierwisch 1987, Schwarzschild & Wilkinson 2001), and also in contexts involving modality, there is no strict necessity to introduce this a function for the contexts discussed here. Nothing hinges on whether the universal is introduced directly with the comparative, or via maximization. Crucially, we always have some sort of universal quantification (indirectly) over degrees provided by the second argument of the comparative. This gives us a welcome effect when the measure argument is modified by *exactly*. Its scope is ambiguous between rendering the measure itself an exact value (as opposed to a pragmatically imprecise one) or modifying the comparison relation, such that it turns into equality. The meaning of the comparative is still preserved then by addition or subtraction of the measure from the respective degree associated with the comparatum. Consider the following example:

- (92) a. Peter is exactly 2cm taller than everyone else in his class.

When *exactly* modifies the comparative, this sentence means that everyone else in Peter's class is 2cm less the height of Peter, and that they all are of equal height. Later we will also see that this kind of universal quantification is in fact essential for the licensing of the relevant NPIS.

Matters are still a bit more complicated, though. With the schema in (88), the actual comparison relation is hidden in the relation between the degrees plus or minus the

measure, and the schema itself only works when we compare individuals with respect to a certain property. As we have already noticed, comparatives may be clausal as well. (See Lechner 1999, 2001 for arguments in favor of a generalized clausal analysis.) The comparison relation (but other possible relations as well) operate only on degrees, and for sure the comparison predicate embeds the comparative clause. The only way to represent these facts is to introduce an operator-variable relation: the comparative clause denotes a (set of) degrees. This is done by an empty (wh-)operator ranging over the degree(s) which is or which are packed somewhere within the clause. Now we are back to almost standard assumptions. The comparative itself can be given a standard semantics:

$$(93) \quad \|\text{COMP}(d_x)(d_y)\| = 1 \text{ iff } (d_x \geq d_y) \text{ or } (d_x \leq d_y) \text{ under scale reversal.}$$

The two degree values (which may be relative/evaluative) are computed by abstracting over the antecedent and the comparative clause, respectively. In addition,  $d_y$  is not the degree resulting from abstraction over the comparative clause alone ( $\lambda d$ ), but is augmented or subtracted (according to scale direction) by the measure argument of the adjective of the matrix clause ( $d+m$  or  $d-m$  under scale reversal). Let us try to incorporate this basic semantics of the comparative into the general scheme for comparative adjectives, where  $Z$  now refers to the comparative clause as the internal argument of the comparative predicate:

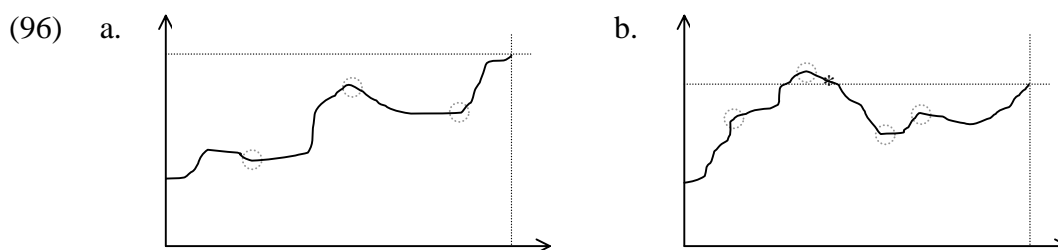
$$(94) \quad \|\text{COMP}(\text{ADJ}(x)(m))(Z)\| = \exists d: \text{DIM}_{\text{ADJ}}(d)(x) \wedge \\ \forall d' | \{ \lambda d' Z [ \dots \text{DIM}_{\text{ADJ}}(d')(y) \dots ] \} : \\ d \geq d' + m \text{ or } d \leq d' - m \text{ under scale reversal}$$

whereas ADJ translates into  $\text{DIM}_{\text{ADJ}}(d)$  (e.g.,  $\|\text{big}(x)\| = \|\text{size}(d)(x)\|$  “ $x$  has size of degree  $d$ ”), with a presupposed ordering  $d > d'$ , and  $Z$  is the formula containing an operator abstracting over a set of degrees related to an identical scale.

Still, we have universal quantification tied to the meaning of the comparative clause. I think that this structure is best analyzed on a par with free relative clauses, which may have a universal or a definite meaning. (See Dayal 1997, von Stechow 2000, Horn 2000a). Several issues await further clarification here, but I think that at this point we should return to NPIS. One peculiarity of the temporal adverbial *jemals/ever* is that they are regarded to always conform to the existential/indefinite NPI paradigm, and, unlike *any*, never display a free-choice interpretation. Comparatives give us a fabulous test ground to distinguish these from plain indefinites. First consider the following pair of sentences, where, again, we assume a scale of degrees of size (and a hidden assumption of perpetual increase.)

- (95) a. Die Firma Apple ist größer als sie je(mals) war.  
 ‘The Apple Company is bigger than it ever was.’  
 b. Die Firma Apple ist größer als sie einmal war.  
 ‘The Apple Company is bigger than it was once.’

One could argue that the truth conditions of the above examples are the same: there is no degree  $d'$  referring to the size of the Apple Company at time  $t_i$ , such that  $d'$  is as big or bigger than the degree  $d$  referring to the size of the Apple Company at time  $t_0$ , where  $t_0$  is the reference time of the sentence. Consider the following graphic representations:

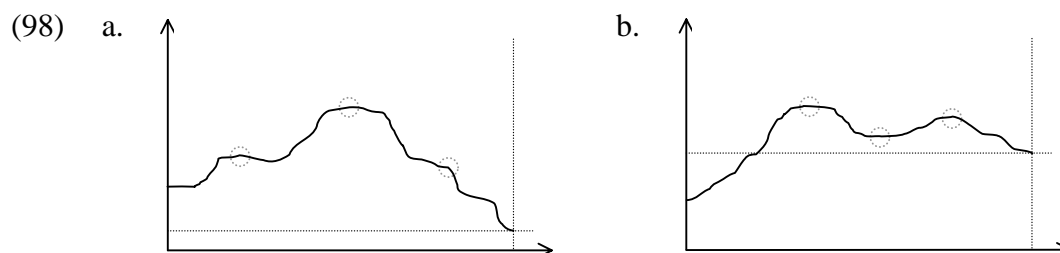


The (a) and the (b) sentence in (95) in our terms differ only minimally in that the sentence with *jemals* explicitly states that the generalization holds for all possible times whereas the sentence with the indefinite *einmal* refers to just some unspecific and indefinite point in time.<sup>23</sup> This (indefinite) point in time can be picked among the relevant situations indicated by the dotted circles. So, only (96a) is an appropriate representation for both sentences, and (96b) apparently is not, because the situation marked with the asterisk invalidates both statements. Given the hidden assumption that it is only relevant when companies grow, it does not really matter, which point in time we look at in (96a). The endpoint  $t_0$ , which marks the reference time of the antecedent, always corresponds to a higher degree. On the other hand, in (96b) we find one situation, which should be considered relevant, but which is higher than the antecedent itself. Hence a member of the set of elements taking part in the comparison invalidates the statement. and (96b) it cannot be a possible scenario for both sentences in (95). Now let us leave the realm of ideal capitalistic scales and consider a company with a rather unstable course of development, and which in fact is now smaller than it used to be.

- (97) a. Die Firma Birne ist kleiner als sie je(mals) war.  
 ‘The Pear Company is smaller than it ever was.’  
 b. Die Firma Birne ist kleiner als sie einmal war.  
 ‘The Pear Company is smaller than it was once.’

<sup>23</sup> This circumstance I only found explicitly mentioned in Schwarzschild & Wilkinson (2001: fn 4).

My intuition is that in this case the two sentences have clearly distinguishable truth conditions. The sentence with *jemals* (97a) reports a rather catastrophic state of affairs: the company must be even smaller than it was when it was founded, whereas (97b) can be taken as not such good news for the current conditions, but not as bad as (97a). Pragmatically triggered, the point in time the indefinite refers to will be taken on the higher end of the scale of size. The indefinite expresses the mere existence of such a point, and (97b) simply states that the company is not at its peak.



The sentences in (97) have two interpretations, according to the dimension, which is associated with the predicate *small*: one where degrees are abstracted over *size*, just as in (95), and one where the relevant dimension is *smallness*. However, the latter option seems to be the less natural one, and some informants didn't get it at all, so I will disregard it here. Let us stick to *size*, which matters. Once the dimension is fixed, then *small* has the same semantic representation as *not-big* (with inner negation, hence scale reversal).<sup>24</sup> The difference to *big* is that the ordering on the scale is reversed, if *x* is smaller than *y* then the degree *d* of *x* is smaller, and not greater than the degree *d'* of *y* (or all members of the set *Y*). Additionally, any overt (or implicit) measure is subtracted from the degree *d'*.

The crucial question is, how is the set *Y* construed, when it contains an indefinite like *einmal* ('once'). Let us assume that some pragmatic criteria of relevance are at work. We search for situations relative to the antecedent, which are either (a) of a higher degree than the antecedent (beyond the dotted horizontal line); or (b) correspond to the ordering expressed by the presupposition (greater or smaller than the antecedent). In the case of *bigger* we must look in both directions (from the degree of the antecedent), we have to look for higher degrees (which would falsify the comparative) and for lower ones, since the presupposition states that all points in fact must be lower. With *smaller*, the pragmatic conditions are more relaxed: we only have to search for higher degrees. This is, I claim, why the sentence in (97b) with *einmal* is not falsified by a situation represented as in (98b).

<sup>24</sup> This is not to argue for a principled semantic decomposition of adjectives in general or for those, which are members of contrary pairs such as *big/tall* and *small*. In fact, I would rather reject such a decomposition. (If it existed, *not small* should exactly mean *big* or *tall*, which definitely is not the case.) What matters here is that both are associated with the same scale, just the presupposed ordering along that scale of degrees is reversed.

If the exhaustive indefinite NPI *jemals* were just a plain indefinite with a widened meaning, one could argue that it is exactly the process of widening which renders (97b) false under (98b), so Kadmon & Landman's (1993) account could be carried over to comparatives involving this type of NPis. So far, it should be clear that I regard their analysis essentially right (and a milestone in the investigation of NPis). However, widening (and strengthening) as defining terms are stipulated, and it would be a great advantage if they could be derived by some more general means.

Moreover, if we still were to accept widening, the first part of K&L's proposal – and as a consequence the assumption that NPis of the *any/ever*-type are indefinites, we run into a problem with the data presented above. Suppose we discard with the pragmatic component (with relevance criteria etc.) for a moment and take a fresh look at sentence (95b) again. In a context that lacks negation or a generic operator in the environment of the item in question, the semantic interpretation of the indefinite *einmal* is the mere existence of a referent: a point in time or a situation in the relevant spatio-temporal domain. Under this view, the representation in (96b), where the company is bigger than in most but not in all situations, is actually appropriate for (95b). And I think by giving (95b) and (96b) a second chance, they can make it. There is a possibility to enforce our argument: consider the adverbial *wieder* ('again'). It carries along a presupposition that the state of affairs under its scope has occurred already in the past, thus it does not occur for the first time. Applied to the comparatives under discussion, an interesting effect arises: the representation in (96b) is the only one which matches the requirements imposed by *wieder*, but the exhaustive indefinite *jemals* is ungrammatical (or contradictory) for reasons already discussed.

- (99) a. \*Die Firma Pflaume ist wieder kleiner/größer als sie je(mals) war.<sup>25</sup>  
       'The Plum Company is smaller/bigger again than it ever was.'  
       b. Die Firma Pflaume ist wieder kleiner/größer als sie einmal war.  
       'The Plum Company is smaller/bigger again than it was once.'

The adverb *wieder* takes the degree *d* of the dimension associated with the adjective at time  $t_0$  and presupposes that this value has been reached once before. *Einmal* refers to some arbitrary point in time, the only condition upon which is that it exists. Hence (96b) is the perfect match. However, this seriously challenges the idea, that *jemals* should be

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<sup>25</sup> There is one marginal interpretation where the main predicate is not interpreted as a stative but as a process. Then *again* can refer to 'becoming bigger and bigger' without creating a contradiction. Crucially, the whole comparative is within the scope of *wieder*, including the complement clause with the NPI. In the more natural interpretation, *wieder* only scopes over the dimension-function, i.e., the predicate denoted by the plain adjective. This difference between the two readings of *wieder* have been long recognised and are referred to as restitutive and repetitive *wieder*. (Cf. von Stechow 1996c.)

analyzed as an abstract indefinite (such as *einmal*) plus widening, since *einmal* really refers to just one single point, where all the conditions are met. So, where should we start with widening? Although the widening proposal offers us appealing results, the base of widening seems to be seriously mistaken. All the examples presented in K&L involve some kind of downward entailing environment, where the indefinites are immediately bound by a DE-operator. Therefore, the indefinites are not interpreted strictly existential, all that remains is their denotation as a set of entities. When an NPI like *any* is inserted in such a position, the difference in meaning can well be described as widening (which in K&L's terms amount to the removal of salient properties). In the contexts presented here, the indefinite in the comparative clauses is still existentially bound, since the set Y of entities taking part in the comparison is established independently. The universal quantification within the comparison has scope over the elements of this set, but it does not create it. In our case the relevant set Y consists of temporal slices of the respective company. Depending on the type of the temporal modifier (implicit, indefinite, or universal-indefinite) the set of temporal slices is established as containing one indefinite element or all potential elements. *Jemals* in German and *ever* in English convey a distributive/universal meaning, hence the set of temporal slices spans over all possible stages of the subject referent, i.e., the company.

Comparatives allow us to clearly distinguish plain indefinites, which receive an existential interpretation in the relevant contexts, from weak/exhaustive NPIS, which reveal their universal-distributive meaning in these contexts. I think that this argument can be transferred onto *any* without much change. Consider the following pair:

- (100) a. Peter is taller than anybody (else) in his class.  
 b. Peter is taller than somebody in his class.

These facts might be regarded even troublesome for Chierchia's (2001) proposal for *any*. Actually, without further remedy it is the end of any theory that makes use of an apparent parallelism between *any* and an indefinite counterpart like *some*, even if the latter is conceived just as an abstract plain indefinite.

## 2.4. Interim conclusions

Let us summarise what we have gained so far. The status of *any* as a universal quantifier seems to be parasitic on certain licensing environments that bring some sort of universality with themselves: e.g. generics, modals, conditionals etc. The crucial counterexample to universal meaning is the core 'existential NPI' context: negation proper and contexts that entail or implicate negation, where it is hard to argue that *any* conveys a universal meaning. Unless one enforces obligatory quantifier raising above its negative licenser, as

suggested by Eisner (1995), which I take for implausible on conceptual grounds. What really speaks against this option is the observation that negation rather blocks covert movement, hence also quantifier raising. (Cf. Beck 1996, and subsequent work; Sauerland & Heck 2004.)

The new idea (but maybe not so new overall) is that *any* is a quantifier that lacks specific content. Its primary function is to block binding of the variable associated with the (indefinite) noun phrase by a higher operator or by existential closure. In turn, the whole quantified structure cannot be given any restricted reference, the possibility of choosing any available reference relative to any potential situation index must be kept intact. This is very much in the spirit of Dayal (1998) and subsequent work. One difference to her analysis is that the universal operator governing the freedom of choice relative to situations does not come out as an independent object in the sense of a universal quantifier, but rather arises as a consequence of the exempted meaning of *any*. I think that this view is also compatible with Kratzer & Shimoyama's (2002) treatment of free-choice as projecting alternatives in a Hamblin style semantics.

To illustrate what I have in mind, let us consider a comparative view on universal quantification. As an operator it always involves the  $\forall$ -operator, but it may also be associated with grammatical elements commonly referred to as determiners. An example for an item, which is both, would be universal quantifiers as we are used to them: *every* in English, *jeder* in German. Sometimes universal quantifiers show up as (VP-)adverbials: *dōu* in Mandarin Chinese, *tout* in French, and maybe stranded *each* and *all* in English and quite plausibly *alle(n/m/r/s)* in German,<sup>26</sup> but definitely also the distributive marker

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<sup>26</sup> Many cases where *all* is involved in German can be aligned to the phenomenon of split topicalisation. However, we find such constructions (with partitive *aller* as animate and *alles* as non-animate forms) also in WH-contexts, which do not lend themselves so easily to such an analysis (i.). The only argument in favor of split-topicalisation, in this case better termed wh-subextraction, is that *alle(r/s)* may be pied-piped with the wh-word (ii.).

- |     |                              |                            |
|-----|------------------------------|----------------------------|
| i.  | Wen hast du aller getroffen? | Was hast du alles gekauft? |
|     | Who have you all-PART met    | What have you all bought   |
| ii. | Wen aller hast du getroffen? | Was alles hast du gekauft? |
|     | Who all-PART have you met    | What all have you bought   |

Interestingly, while the relevant universal quantifiers may take scope below negation when associated with a (split-)topic in the common sense, the universals must not be in the scope of negation (or other operators), if they are to be associated with a wh-word. This is a typical case of intervention effect, see Beck (2004, 2006) for a thorough discussion.

- |      |  |
|------|--|
| iii. | %Wen hast du nicht aller getroffen!                                      |
|      | Who have you not all met   |
|      | – rhetorical: bias towards expectation of large set of irrelevant people |
|      | – *'Who did you meet, but not all of them?'                              |

*je(weils)*. Still, how does *any* fit into that picture? It is not a universal determiner, hence also not a strong quantifier with clausal scope, but rather a weak quantifier with a universal operator associated with it, that ranges over paired situation/individual variables. What goes wrong in the cases where *any* is said not to be licensed is that the extension of situations associated with the noun phrase to situations denoted by the main proposition cannot be fulfilled. Here the notion of downward entailment comes into play, since it allows for inferences from larger to smaller sets, hence from a set of all possible assignments associated with situation/individual pairs to more restricted, specific ones. The same line of reasoning can be applied to the temporal quantifier *ever/jemals*. The crucial difference to *any* as a nominal bleached quantifier is that it does not range over situation/individual pairs but over situations alone. Therefore, it normally does not make sense to try out all assignments (one each time) and see whether these can be fulfilled, as is the case with free-choice *any*, and we do not expect *ever* to have an interpretation as a free-choice item. This prediction seems to be borne out with one exception, which I discussed in section (2.3) – comparatives, where we may well extend our assignment of situations to all possible situations available to the main predicate of the comparative clause.

In a way there is something going on with these items, which is hard to express formally with standard notions of quantification, since weak NPis are not universal quantifiers per se. I take the quantificational part of their meaning as an indication that their scope at LF will be assigned quite locally, maybe they must not move at all. One reason for the prohibition against scope extension is that inverse linking is in many cases (though not all) accompanied with contrastive topic-focus configurations. We will see in the next chapter with strong NPis, that there is a general incompatibility of NPis with contrastive topics. The reason for that peculiarity is that contrastive focus on a topic constituent creates alternatives by itself. These alternatives are most likely to be associated with elements that are needed to license the NPis in question. Within the alternatives projected upon the contrastive topic-focus, the NPI would not be in a configuration, where it is licensed, since the contrast most eagerly points to a scalar reversal.

On the other hand we have to reckon on the universal nature of weak NPis. I think that their universal status may be best established in analogy to choice functions, as proposed by Reinhart (1997), which bind the variables of indefinites, and by different levels, where these functions are introduced, different scope properties of indefinites, such as de dicto and de re readings can be accounted for. In case of weak NPis, the associated functions determine the final scope of the universal operator ranging over possible assignments, but the difference is that no specific choices must be made. As already mentioned, in a more

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- iv. Die Kinder habe ich nicht alle getroffen.  
 The children have I not all met.  
 ‘Regarding the children I haven’t met all of them.’



recent paper, Kratzer & Shimoyama (2002) explicitly refer to Hamblin alternatives which project until they are bound by some appropriate operator, and most recently Beck (2006) gives intervention effects of all sorts a generalized treatment in terms of operators ranging over alternatives. All of these proposals show that the search for an even more general picture of quantification, alternatives, variable binding and scope is on the right track. What I hope to have contributed here is an idea, how the semantic properties of *any* and other weak NPIS can be viewed from an even more intriguing perspective, which allows us to treat the various uses in exactly the same way.



### 3. Strong NPIs, scales, and focus

In chapter 1 we have reflected upon 3 approaches that deal with ‘strong NPIs’. Recall that the terminology stems from Zwarts’ (1990/93, 1998) distinction between classes of NPIs according to their licensing demands. ‘Strong NPIs’ in his terms must be licensed by an anti-additive operator. While this characterization may be viewed as too strong (cf. Krifka’s example with ‘*hardly anyone*’) and be criticized as still owing an explanatory impact, it is a good starting point for further empirical investigations. Krifka (1995) makes an interesting remark that maybe it is not anti-additivity itself, which determines the relevant type of licenser, but the extreme character of these licensors, extreme with respect to other items on negative scales, which matches the extreme character of strong NPIs. His analysis of ‘strong NPIs’ mimics a scalar account by imposing a condition on the relevant illocutionary operator (emphatic assertion), in particular that the proposition with the item in foreground has to be less likely than the propositions formed with any of the alternatives. Hence, the item in foreground must be the least likely, whereas likelihood can be translated into semantic strength.

The other approach essentially blows into the same horn, with the only difference that the relevant mechanics is not tied to an assertive operator, but rather implemented as a potentially covert focus marker (‘*even*’) with a presupposed likelihood scale and an associated implicature, which expresses the fact that basically all the propositions with alternatives must be true. This line of argumentation was first pursued by Horn at various occasions, specifically Lee & Horn (1994), but also employed in Lahiri (1996, 1998) for ‘*bhii*+indefinite’ phrases in Hindi, which behave alike strong NPIs. Chierchia’s (2001) proposal generalizes implicatures for scalar items, and we will see below that a combination of all 3 theoretical streams gives us a picture for strong NPIs where the relevant properties come out quite naturally.

In the following we will investigate 3 major questions, to a large extent based on empirical data from German. How can the specific scalar properties of NPIs be correlated with focus? In particular we want to provide a survey of various focus markers that in some languages are even mandatory in order to form strong NPIs. Secondly, how can we achieve a better understanding for the limited set of potential licensors? And is it possible to discern more precisely different types of strong NPIs?

#### 3.1. (Mis-)matching scales

Let us start with a case that appears to be quite straightforward: items of the form ‘*even a single N*’. Provided the focus marker *even* is present, we automatically have to deal with alternatives to what is in focus, in the case at hand ‘*a single N*’. What is striking that the

expression ‘*single*’ forces us to take the alternatives from a quantitative scale. This is not the case with ordinary numerals. Consider the following examples:

- (1) a. Today I saw even two three-toed SLOTHS.  
 b. Today I saw even TWO three-toed sloths.

The first sentence associates the full DP ‘*two three-toed sloths*’ with focus, and it could be the case that the numeral is taken as given, for example in a context like on Noah’s ship, where all animals come in pairs, but Noah has problems to find certain animals. Normally the alternatives in that case would have different numbers and different nouns, with the associated presupposition that these animals would be more likely to find, hence to ‘*see*’ as the frame suggests. In the second sentence, it is about watching three-toed sloths, and the hypothesis would be that it is more likely to see one than two together. When we exchange the numeral to one, the picture is slightly shifts. (Grammaticality judgements do not reflect syntactic well-formedness here, but rather appropriateness of a given assertion with respect to a given context, which in turn is matched upon our world knowledge. I will use asterisks to indicate sentences which definitely violate pragmatic principles, whereas for inappropriate assertions I use the #-sign and for ambiguous sentences, for which the most straightforward or intended reading is impossible, the % sign will be used.)

- (2) a. Today I saw even one three-toed SLOTH.  
 b. %Today I saw even ONE three-toed sloth.

For the first prosodic structure, nothing much changes, but when we put stress on the numeral *one*, hence putting it under narrow focus, while backgrounding the noun phrase *three-toed sloth*, either we lack sensible alternatives (which goes counter the requirements of focus semantics) or we have to infer that it would be very rare and unlikely to see a single three-toed sloth, because they would normally cling together in groups. Here we see pragmatics at work, which tells us which circumstances are more likely than others. In this jungle context we can imagine both kinds of a probability scale (perhaps not precisely with three-toed sloths.) But there are contexts, where it is virtually impossible to infer the reversed scale, for example, when an action is conceptualized as incremental.

Let us create a context with a contest of eating dumplings. Here, we have the proper noun already backgrounded, so the item in focus will be the numeral, and it is more likely to eat less dumplings than to eat more. Applying our experiment to this context reveals that the focus marker *even* is incompatible with the minimum number, because no alternatives can be construed. Having the number *two* instead is still pragmatically odd, for reasons we will immediately discuss.

- (3) a. #Peter ate even TWO dumplings.  
 b. \*Peter ate even ONE dumpling.

While (3b) violates the requirement on a non-empty set of alternatives, in (3b) the accessible scale contains at least 2 elements: the numbers 1 and 2 (and maybe some fractions below 2, if parts of dumplings would count for the contest.) But, as Horn (1969) proposed, the fact that the item in focus marks an endpoint of likelihood has the status of a presupposition. So either the dumpling eating contest as a whole, or at least Peter's assumed capability for eating dumplings (or the size of dumplings used in that context) has to deviate from our world knowledge, since an amount of *two dumplings* is normally taken to be quite low.

I presented this example with two aims: first I want to illustrate that the (incremental) scales are "cut off" at the point where the item in the scope of *even* is located. And second, that pragmatics in a broad sense may guide us to fix the context in a way that it still corresponds to the given assertion, nevertheless, the principles that stand behind may never be violated or graded in any way.

Now back to *a single*. As we know it is precluded from positive statements when it occurs in the scope of a focus operator of the *even* type, at least if it is to be interpreted functioning as a cardinal expression. Compare (4) against (5).

- (4) a. %Peter met even a single WOMAN.  
 b. Peter met even a SINGLE woman.
- (5) a. #Peter ate even a single DUMPLING.  
 b. \*Peter ate even a SINGLE dumpling.

In (4) *single* can have a reading where it expresses not being in a relationship to a partner, thus being interpreted as a regular (restrictive) modifier. But *even* associates with a specific element in focus, so it is either the property of being a woman or of being single. The relevant alternative set may then contain other single human beings more likely to meet (I spare contextual details here) in (4a). This is just a bit odd since being single classifies as a salient property of the alternatives (by constituting 'given' information). Hence the alternative set turns out to be relatively small. Or, in (4b), the alternative set contains women who are not single but in a relationship – provided that it is more likely to meet those (our semantics of *even* forces us to update the context with that restriction.)

In contrast to that, the sentences in (5) disallow the meaning of *single* alluded to in the previous example (married dumplings?). (5a) then can only have an interpretation where Peter would eat single things, out of which the dumpling is the least likely, which is purely odd, but crucially, in (5b) we get the inference that the alternative set must be basically

empty, since for all quantities above one, it would be less likely to have eaten this quantity; and the meaning of *single* also precludes the interpretation where quantities might be conceived as fractions. This also depends on our knowledge about certain objects. Dumplings in principle can be eaten in fractions, whereas seeing three-toed sloths in specific fractions would be rather dramatic.

In short, there is no way to render a valid assertion from (4b), what *single* does is that it induces a scale of numbered quantities, and second that it rather resists an interpretation where this quantity is taken as a salient property of the alternative set (hence being part of the background). What stands in the way is the entailment relation, or the ordering of likelihood on the scale of quantities.

Chierchia's (2001) proposal for scalar implicatures is diametric to these facts, but put together we receive a nice picture, why '*even a single N*' must be a strong NPI. Consider what happens if we calculate the strong meaning for an expression like 'a single N' (without the focus marker *even*)? In upward entailing contexts, such as simple declarative sentences, it constitutes the low endpoint of a scale containing numerals (or put in more general terms – quantities). There are no other elements on that quantity scaled that would be entailed by *a single*, but under the strong meaning there is an implicature that for any element being higher on the scale (in our case this holds for all other elements), the propositions containing them must be false.

This corresponds to the 'cutting off' strategy on scales, stemming from the presupposition of being minimal/extreme (with respect to likelihood). Remember that what is going wrong with the scalar item *a single N* within the scope of *even* is that the assertion is undefined due to a presupposition failure in Horn's sense.<sup>1</sup>

When we embed *even a single N* under a polarity reversing (DE) function, the implicature that for any higher element on the scale the proposition must be false is cancelled, according to Chierchia's algorithm. Since the entailment relations on the scale are reversed the (former) minimal element on the scale now entails all propositions associated with elements higher on the scale. On the other hand, no implicatures arise from the strong meaning of the scalar item, since *a single* in a DE environment is the strongest element of its scale.

So far, we can conclude that Ladusaw's characterization of NPI licensing as a side effect of DE functions is absolutely correct for strong NPIS of the type '*even a single N*'. Before even trying to extend this way of reasoning to other types of NPIS, let us reconsider

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<sup>1</sup> See also Lee & Horn (1995). Although it is not explicit there that alternatives must exist, it can be derived from the presupposition that there must be a scale (with the item in focus as the minimal endpoint.) A scale consisting of just one member can easily be argued to be not a scale at all. Also Chierchia, though not referring to focus, has a similar constraint in his discussion of axioms on scales.

Zwart's observation that being in the scope of a downward entailing functor is still too weak a condition for strong NPIS:

- (6) At (the) most 3 students have eaten fruit →  
At (the) most 3 students have eaten apples.
- (7) a. Höchstens drei Menschen haben den Yeti jemals gesehen  
'at (the) most three human beings have ever seen Yeti'  
b. ??Höchstens drei Studenten haben auch nur ein einziges Buch gelesen  
'??at (the) most three students read even a single book'

As can be seen in (6), *at (the) most n* is a DE operator. If the maximal number of students having eaten fruit (the superset) is restricted by 3, then the maximal number of students having eaten something more specific, as for example apples, is definitely also restricted by 3, but not vice versa. However, in (7b) the strong NPI '*auch nur ein einziges Buch/even a single book*' is clearly not grammatical. This indicates that DE is a necessary condition for licensing of strong NPIS, but not a sufficient one.

Intuitively, what seems to go wrong in (7b) is that while the scales are ordered in the right direction on the meaning of *at (the) most*, it still may be the case that there are 1, 2, up to 3 students who actually have read one (or even more) books. The DE quantifier *at (the) most* only restricts the cardinality of the set of potential referents, but it leaves open whether the set is empty or not (in fact, there might actually be an existential implicature expressing that the set is not empty.) But this existential implicature expresses a meaning where the NPI is in an upward entailing context; hence we get contradictory implicatures from the focus marker and from the (minimal, cardinal) NPI. Reminiscent of Linebarger's indirect licensing proposal, which states that NPIS are licensed if there exists a negative implicature where the NPI is core licensed (in the immediate scope of negation), and which strengthens the meaning of the sentence (excluding all other non-negative implicatures), we can now formulate a new condition on licensing of strong NPIS. In a way, it is similar to Linebarger's indirect licensing, but the role of pragmatic inference is viewed from the reverse perspective.

- (8) Licensing of strong NPIS: (preliminary version)  
A strong NPI must be in the scope of a DE (scale reversing) operator, and there must not exist any (existential) implicature where it is not in the scope of that DE operator.

With the help of this definition we can also explain why strong NPIS in the examples from Linebarger (1981) and Heim (1984) behave differently from indefinite NPIS in that they apparently invoke 'negative force'. The example is repeated below:

- (9) Every restaurant that charges (so much as) a (single) dime for iceberg lettuce  
 - ought to be closed down.  
 - ??/\* actually has four stars in the handbook.

In Linebarger's term the sentence must express some kind of threat or other adversative attitude, which leads to a negative implicature. But under closer inspection, the two variants of the given example are much more different than just having a different attitude. The first variant employs a modal and has a meaning similar to counterfactual conditionals. Therefore, there is no existential implicature expressing that there exist certain restaurants in the discourse, and the strong NPI makes sense. On the other hand, having four stars in the handbook is a property we can assume that at least certain restaurants fulfill. The adverbial 'actually' more so suggests that we are talking about restaurants that can be assumed to be instantiated in the discourse. The implicature, then, is that there are certain restaurants, 'that charge so much as a single dime' etc., an implicature where the NPI itself is not in the scope of a DE operator and gives rise to contradictory implications.

Notice that the ban on existential implicatures is akin to what is required with Existential Polarity Wh-expressions (weakest NPis) in Chinese (cf. Lin 1995) or other languages. This is an interesting fact, since in Zwarts (1990/93, 1998) and subsequent work it was assumed that licensing capabilities are layered according to logical strength. However, if we are right, we have two independent properties – anti-existentiality, which can be aligned with Zwarts' notion of veridicality, and DE-ness, each of them governing their own type of NPis (weakest and weak), and in combination they also license strong NPis.

Also, I find it a bit hard to construe an apt negative implicature for the sentence in (9). The cases Linebarger refers to in connection with universal quantifiers or conditionals can be translated into threats (such as '*don't budge an inch, or...*'). This is impossible here. Perhaps, one could assume an implicature like '*There should be no restaurants that ...*', but I don't think that this is exactly what (9) expresses.

On the other hand, a ban on positive implicatures only demands a robust neuter attitude towards whether there exist restaurants fulfilling the requirement expressed by the relative clause or not.

Krifka (1995) had the idea that since strong NPis are extreme with respect to their alternatives, the licensors must be extreme, too, thus excluding quantificational elements which are only downward entailing, but not fulfilling Zwarts' requirement on anti-additivity. One of the sentences he gives as an example that anti-additivity might be too strict is repeated below. In addition, one can observe that while the quantor *few* on its non-proportional reading has a scalar implicature that is tantamount to an existential implicature, one may add information to the context suggesting that this implicature should be cancelled. I feel that grammaticality for strong NPis increases significantly.



- (10) a. Hardly ANYONE lifted a FINGER to help me. [Krifka 1995, ex. 46a]
- (11) ??Few students read even a single book  $\Rightarrow$   
not no student read even a single book  $\approx$  some student(s) read a book
- (12) a. \*Few students read even a single book, but at least there were some.  
b. ?Few students read even a single book, if there were any at all.  
c. Few students, if any, read even a single book.
- (13) a. \*Wenige Studenten haben auch nur ein einziges Buch gelesen, aber es gab welche.  
b. ?Wenige Studenten haben auch nur ein einziges Buch gelesen, wenn überhaupt welche.  
c. Wenige Studenten, wenn nicht gar keine, haben auch nur ein einziges Buch gelesen.

It is interesting to see that the implicature in (11), which is generated according to Chierchia's rules, is not enough to exclude the NPI, if the negated stronger proposition is analyzed as being in the scope of an external negation. Only the inference that *not ... no student* entails *some student* makes the NPI inappropriate. Recall that entailment relations do not count in most cases, as observed already in Baker (1971), and implemented in various versions as for example Chierchia's 'roofing constraint', or Krifka's locality of assertion.

- (14) It is not the case that no student read even a single book.

A phenomenon, which fits the discussion and which has been observed first by Laka (1990) but then overlooked in most of the literature, is the apparent lack of reconstruction at LF, when a constituent containing an NPI is topicalized. Laka noticed that NPis in VP-topicalized position and cleft sentences are not licensed even though there is either overt negation or an adversative predicate present in the clause. Her conclusion at that time was that NPis should be licensed at S-structure and not at LF, where the topicalized constituents could be interpreted in the originating position. Her argument is as follows: if a topicalized constituent is reconstructed at LF, the NPI is again in the scope of its licenser, therefore the sentences should be grammatical. At S-structure, the topicalized VP is not c-commanded by negation or an adversative predicate. This would explain the ill-formedness of those sentences.

- (15) a. \*<sub>[VP Buy any books]</sub><sub>i</sub>, she didn't t<sub>i</sub> .  
b. \*<sub>[VP Buy any records]</sub> is what she refused to do. [Laka 1990: 195]

In general, reconstruction from topic position (Spec.CP) is possible for quantifying elements, especially when a constituent crosses negation. To illustrate this I will use data from German, since VP- (or remnant-)topicalization is much easier to handle in this language. When the whole VP is topicalised over a negative time adverbial (*niemals*) as in (16a), we obligatorily get contrastive negation, and the topicalised constituent must be interpreted in its reconstructed position. In (16a) the universal is caught within an infinitival clause, so it cannot possibly have scope over the adversative predicate.

- (16) a. [Jedes Buch gelesen] hat Hans noch nie.  $\neg > \forall$   
 Every book read has Hans yet never  
 ‘Read every book Hans never did.’
- b. [Jedes Buch zu lesen] hat sich Maria geweigert.  $\neg_{(advers.)} > \forall$   
 Every book to read has Maria refused  
 ‘Read every book is what Maria refused to.’

Only when the universal is not embedded in a VP-like constituent, but moves on its own, and additionally, when negation is sentence negation, hence allowing for situations, in which something did not happen, we may reconstruct into a position higher than negation (presumably derived by scrambling). In that case we do not get a contrastive topic interpretation, and the difference is marked by a different prosodic contour. The surface order in embedded sentences shows when scrambling must have taken place, and there the scope-relations are fixed again.

- (17) a. [Jedes Buch] hat Hans nicht gelesen.  $\neg > \forall / \forall > \neg$   
 Every book has Hans not read  
 ‘Hans didn’t read every book / For every book Hans did not read it.’
- b. ...weil Hans nicht jedes Buch gelesen hat.  $\neg > \forall$
- c. ...weil Hans jedes Buch nicht gelesen hat.  $\forall > \neg$

Reconstruction has also to be assumed for licensing NPIS in subject clauses (Ross 1967, Progovac 1988, 1994) and with bleached verbs (Uribe-Etxebarria 1994).<sup>2</sup>

- (18) a. That John ever slept is impossible.  
 b. That anyone at all came surprised Bill.

<sup>2</sup> The English version of (19) is from Uribe-Etxebarria’s dissertation. See the discussion therein that it is not the difference between stage- and individual-level predicates, but rather the ‘bleached’ semantics of the matrix predicate, which denotes existence or coming into existence.

- (19) weil ein Doktor, der auch nur eine (einzige) Operation erfolgreich durchgeführt hat
- nicht aufzutreiben war.
  - \*nicht intelligent war.
  - \*nicht den Mt. Everest bestiegen hat.
- 'because a doctor who has performed even a single operation successfully*
- wasn't available.*
  - \*wasn't intelligent.*
  - \*hasn't climbed Mt. Everest.'*

We are now in a situation where we can recapitulate that reconstruction takes place at LF, and when negation is present, the whole sentence has to be interpreted with a contrastive topic. Furthermore reconstruction is necessary for NPI licensing in subject clauses or when the NPI is embedded in a constituent in subject position, and the main predicate is of a certain 'bleached' type. Still, NPIs are not licensed within topicalised VPs. One difference between this constellation and subject clauses is that in the cases where NPIs is licensed by reconstruction it is embedded in a whole clause, whereas in the problematic cases it is only part of a topicalized VP. Laka (1990), and also Progovac (1994) assume that clauses can be headed by a complementizer that itself carries a feature [+neg] (or – as Progovac would argue – has an appropriate operator in its specifier), which in turn licenses NPIs. Although VP-topicalization may have slightly different properties in German, the observed effect is present here as well:

- (20) a. \*Aber [auch nur ein (einziges) Buch gekauft] hat Hans noch nie  
(in seinem Leben).  
But [even a single book bought] has Hans never in his life
- b. \*Aber [auch nur ein einziges Buch zu kaufen] hat Maria  
sich geweigert/verweigert.  
But [even a single book to buy] has Maria refused

So far, Laka's argument could be taken as valid, although it would be strange, if surface structure would determine the licensing capabilities of downward entailing operators. Clearly, we do not want to maintain this claim. Let us consider a few more examples. The crucial observation is that licensing also fails if only the NPI is topicalized (21a) and, even worse, if only the remnant VP (the participle) is in topic position while the NPI remains structurally in the scope of negation, even on S-structure. This clearly shows that the unwanted generalization that S-structure would play a role in NPI licensing is untenable anyway, but it calls for a coherent explanation.

- (21) a. \*Auch nur ein (einziges) Buch hat Hans noch nie in seinem Leben gekauft.  
Even a single book has Hans never in his life bought
- b. ??/\*Gekauft hat Hans noch nie (in seinem Leben) auch nur ein (einziges) Buch.  
Bought has Hans never in his life even a single book

The problem can be approached by considering what topicalization actually does. When negation is overtly present, the constituent in topic position is interpreted as a contrastive topic, i.e., it receives contrastive focus. The assertion of such a sentence is that the propositional scheme is true with the element in focus within the scope of negation (hence reconstructed). But for all alternatives the propositional scheme must hold without negation.

In other words, there is no negation, hence no licenser present in the alternatives. When the strong NPI is still part of any of the alternatives, it is unlicensed there, although it is licensed in the assertion. But also if the strong NPI itself is in focus, the propositions corresponding to the alternative set assert a positive statement, whereas the scalar nature of the NPI demands that its alternatives yield negative statements as well. This is why strong NPIS are incompatible with contrastive topics, whether or not they are part of the topicalised constituent or within the scope of the inhibited licenser at the surface. The explanation given here can be reinforced by showing that it does not always apply. Irene Heim (p.c.) pointed out to me that the effect disappears if we force the alternative set to consist of propositions with an entirely different structure, thus lacking the position where the strong NPI or any of alternatives show up.

- (22) a. ?Geredet und überlegt hat er schon oft, aber [jemals auch nur irgendetwas zu arbeiten] hat er noch nie geglaubt daß nötig wäre.  
talked and thought has he already often, but ever just anything to work has he yet never believed that would be necessary  
*'He has often been talking and thinking, but he never found it necessary to do anything.'*
- b. ?In den Laden spaziert ist sie schon oft und die Verkäuferinnen sekkieren ist ihre Lieblingsbeschäftigung, aber [auch nur ein (einziges) Buch gekauft] hat sie dort noch nie.  
in the shop walked has she already often and the assistants to tease is her favourite hobby, but even a single book bought has she there yet never  
*'She has often been to the shop and she loves to tease the assistants, but she never bought even a single book there.'*

Other strong NPIS, such as idioms of the type ‘*budge an inch*’ seem to work in a parallel manner. Expressing the minimum value on some scale as part of their intrinsic meaning, they do not need an extra focus marker (at least in English)<sup>3</sup>. They somewhat differ from the strong NPIS we have discussed, insofar as some of them express the minimal measure of an action, which makes licensing possible in certain cases excluded for the ‘*even a single*’-type of NPIS. A possible explanation for why these items occur more freely could be that it is less easy to construe an existential implicature for actions.

The differences between the relevant types of strong NPIS comes out most clearly with ‘only’, which is neither DE nor UE in the strict sense.<sup>4</sup> The focus operator *only* presupposes that the proposition holds for the constituent in focus, and it asserts that the proposition is not true of the (focus-)alternatives. A paraphrase would be ‘*no one except  $\alpha$* ’, where  $\alpha$  is the focus abstracted over from the propositional scheme.<sup>5</sup> ‘No one’ itself is DE, but the explicit assertion of an exception blocks the DE effect again. Compare the following examples:

- (23) a. \*Only John has read even a single book.  
 b. \*Only the piano budged an inch.  
 c. ?(?)Only John gave a red cent to charity.  
 d. ?Only John lifted a finger to help Mary.

The first two examples are clearly out, (23a) behaves just like it should under our assumptions. Movement (23b) can well be measured, and an item denoting minimal movement in the sense of an NPI is equally sensitive to existential implications. (23c) is

<sup>3</sup> Note that in German the focus marker *auch nur* (the negative counterpart to *sogar* “even”) is required as a part of idiomatic NPIS, whenever a marker for negation, i.e., a negative determiner, is not part of the idiom.

- i. Der Kasten hat sich keinen Zentimeter von der Stelle gerührt.  
 ‘The drawer didn’t budge an inch.’  
 ii. Ich bezweifle, daß sich der Kasten ??(auch nur) einen Zentimeter von der Stelle gerührt hat.  
 ‘I doubt that the drawer budged an inch.’

<sup>4</sup> Von Stechow (1999) has shown that phrases of the form *only*+proper noun are downward entailing in their scope, but only in a special sense: if the truth of the narrower pair of sentences is presupposed, entailment holds from the wider to the narrower. “Only John ate pizza” entails “Only John ate a Quattro Stagioni” provided that the presupposition that John in fact ate a Quattro Stagioni is fulfilled. Von Stechow called this kind of entailment “Strawson entailment”, and it may be used to explain why weak NPIS are fully appropriate in these structures. See also Wagner (2005) for a detailed analysis of association with focus by *only* and a quite sophisticated argumentation based on NPI-effects that both, syntactic LF-movement and contextually determined association, play a role.

<sup>5</sup> Crucially, this is only a paraphrase, so there are certain subtle differences, especially concerning the focus structure.

interesting because ‘a red cent’ suggests a behavior similar to the previous two examples, being the minimal amount of money to be given to charity. However, the idiomatic property prevails here, if one renders the meaning as denoting an amount on a scale of quantity, the sentence would be as ungrammatical as the ones before, but if one rather thinks of the idiom as describing the action of giving, then this effect drastically weakens. We see this in (23d), which asserts that ‘all others did nothing’, and presupposes that ‘John did something minimal’. Remember that we proposed only a prohibition against strong NPIS showing up in an existential implicature. While the presupposition under discussion is part of the meaning of *only*, it is not tied to the assertion as implicatures are. It can well be that the NPI as such is not contained in it. Notice as well that in the former case we dealt with scales of quantity, while with NPIS denoting minimal action the relevant scale is rather one of applicability. Therefore the type of these items would be one of a ‘not-so-strong’ NPI. If these NPIS are strengthened with ‘at all’ the marginal acceptability immediately vanishes.

- (24) a. \*Only John gave a red cent at all to charity.  
 b. \*Only John lifted a finger at all to help Mary.

It could be also hypothesized that an NPI like ‘*lift a finger*’ is in fact de-associated from emphasis (or a covert focus marker like *even*). Then it would come out more naturally, why its behavior tends to be more close to weak NPIS than other strong NPIS, which directly refer to quantities. A potential argument for such a hypothesis comes from German. While most German strong NPIS involve a complex focus marker ‘*auch nur*’, which by itself has properties akin to NPIS, the idiom parallel to English ‘*lift a finger*’ – ‘*einen Finger rühren*’ may well be used without an overt focus marker. Exactly in the cases discussed this idiom must not show up with ‘*auch nur*’:

- (25) a. ?Nur Peter hat einen Finger gerührt um Maria zu helfen.  
 ?‘*Only Peter did at least anything to help Mary.*’  
 b. \* Nur Peter hat auch nur einen Finger gerührt um Maria zu helfen.  
 \*‘*Only Peter did at least anything at all to help Mary.*’

In this section we have seen that when expressions denoting minimal quantities are in the scope of a focus marker of the type expressed by the focus particle *even* in English, then these expressions must be associated with focus. (Krifka (1995) connected this effect to emphasis in assertions, thus exempting the NPIS in question from having an overt focus marker, which is definitely the case in English.) Due to their inherent scalar character and entailment relations based on likelihood, these expressions produce a clash with the meaning of the focus particle, since no alternatives are valid in positive contexts. This can

be shown explicitly by applying Chierchia's algorithm for scalar implicatures in connection with strong meanings. Hence their behavior as strong NPis. Being in the (immediate) scope of a DE-expression is a necessary prerequisite, but in addition we had to propose a ban on existential implicatures, a reverse approach to Linebarger's indirect licensing with negative implicatures. This prohibition opens a straightforward explanation for the difference between strong and weak NPis in the data discussed in Heim (1984).

To support this view, we also discussed data from English and German with contrastive topics. It can be shown that as long as the alternatives associated with the contrastive negation contain the NPI (or alternatives to the NPI), we arrive at a contradiction. Therefore Laka's (1990) suggestion that NPI licensing would be sensitive to surface ordering lacks any support, moreover, we can also account for constructions with contrastive topics in which the NPI would be in the scope of the licenser at the surface. Furthermore, we speculated about different types of strong NPis. The relevant data is the graded (un-)grammaticality of strong NPis in the scope of *only DP* phrases, which are DE in the sense of von Stechow's notion of 'Strawson entailment', hence license weak NPis, but not strong ones. We proposed that *only* presupposes the truth of a proposition with the element in focus, which can be transferred to an existential implicature violating the prohibition against such implicatures. With strong NPis expressing minimal action, which are associated with a scale of applicability, one can argue that the relevant implicature does not contain the NPI per se, but rather is associated with a meaning where the amount of action is rendered as very small, perhaps beyond standard relevance. This, however, does not imply existence of something, whereas alternatives are handled properly by the DE-ness of the licenser.

The crucial property of these items is their scalar nature, which has a double effect. Once it defines likelihood associated with the emphatic focus marker, and in the second run we can employ Chierchia's algorithm on scalar implicatures. The two, however, work together. In positive contexts they render a sentence unassertable, violating the presupposition that there are appropriate alternatives. In downward entailing contexts likelihood is on the right side with respect to alternatives, and the problematic scalar implicatures disappear. In the next section we will have a closer look at scalar implicatures with respect to different types of operators inducing downward entailment. We will see that Chierchia's (2001) claim that scalar implicatures are computed recursively, but NPI licensing takes place locally and is frozen thereafter is in fact a bit too strong. A comparison between negation and negative quantifiers on the one hand and weaker DE expressions like *few* or *fewer than n* reveals some more insights on the anti-additivity requirement proposed by Zwarts.

### 3.2. Scalar implicatures revisited (once more)

Let us reconsider the locality of NPI licensing with respect to the computation of scalar implicatures associated with strong NPIs. It has been shown in chapter 1 that Linebarger's immediate scope constraint can be integrated into a more principled theory on the basis of Chierchia's algorithm for strong meanings and scalar implicatures. However, when Chierchia discusses NPIs, he refers to a 'roofing constraint', which in his (2001) paper he implements as universal closure of widening functions. It is basically meant to explain why an expression containing a DE operator and a properly licensed NPI still retains its capacity for the license of that NPI even if it is embedded under a higher DE-operator, such as negation or adversative predicates.

- (26) a. Peter never read even a single book on syntax.  
 b. I doubt that Peter has read even a single book on syntax.  
 c. I doubt that Peter never read even a single book on syntax.

Or consider an example from Chierchia's original proposal with two negations cancelling each other out. In (27b,c) the semantic representations are given according to the assumption that *any* contributes a widening function ( $g(D)$ ) on the domain of quantification. In terms of strength of information, the plain indefinite gives the stronger statement (since the semantic context is a positive one). So, contrary to fact, the NPI *any* should not be licensed.

- (27) a. It is not true that there aren't any potatoes.  
 b. Value on standard domain  $\neg\neg \exists_{Dx} [\text{potatoes}(x)]$   
 c. Value on widened domain  $\neg\neg \exists_{g(D)x} [\text{potatoes}(x)]$  [Chierchia 2001, ex. 107]

It has to be noticed, how Chierchia actually implements the polarity characteristics of a NPI like *any*. Deriving from Kadmon & Landman (1993), *any* is taken to be an indefinite. Unfortunately, Chierchia associates the 'alternative' of *any* with *some*, this has to do with his notion of 'blocking', which he uses to explain why strengthening must take place.<sup>6</sup>

<sup>6</sup> Although this chapter is not dedicated to the properties of *any*, it is worthwhile to consider this matter here. Citing from the original text: "*I think that the proper way of thinking of (113) is in terms of something like 'blocking', as is familiar from much work in morphology. The presupposition to which NPIs are subject puts them in an 'elsewhere' relation with indefinites, on the assumption that the former are parasitic upon the latter. Intuitively, NPIs are a more marked version of indefinites (not dissimilar from, say, the relation between pronouns and their clitic counterparts). This brings about a sort of blocking effect, whereby the use of NPIs is blocked by the indefinites whenever the former don't give rise to a communicational advantage over the latter.*" [Chierchia 2001: 35] While there is a long history of treating *any* as an indefinite-plus,



Additionally, it is associated with a widening function ( $g$ ), which has the potential to expand the domain of reference ( $D$ ). Therefore  $D$  is only a subset and not a proper subset of  $g(D)$ .<sup>7</sup> Here, he does not really depart from K&L, who also claimed that widening may not be perceived in certain contexts (such as *any* in the scope of sentential negation.)

(28)  $\text{any}' = \lambda P \lambda Q \text{some}_{g(D)'}(P)(Q)$  (where, for any  $D$ ,  $g(D) \supseteq D$ )

[Chierchia 2001, ex. 112]

Just as a side-remark, remember that Krifka had a different position upon the definition of the basic characteristics of *any*. The alleged widening effect is just an epiphenomenon of its exhaustive nature in weak contexts, or can be derived from its scalar nature in emphatic contexts. But furthermore, widening must also lead to strengthening. This circumstance was already mentioned by Linebarger, but implemented in a rather different way. While Krifka posits this condition directly in the pragmatic properties of assertions, Chierchia ties this requirement to the observable locality effects. What he proposes is a condition on universal domain closure on widening functions.<sup>8</sup> The bold face  $\mathbf{O}$  is an operator that ranges over functions expanding the domain of reference ( $g$ ), and “ $\Delta$  [...] ranges over the domain expansions the speaker may be willing to entertain. [Chierchia 2001:34]

(29) Strengthening (/blocking)

$\|\mathbf{O}_{\Delta} g\phi\| = \forall g \in \Delta \|\phi\|$  , if  $\forall g \in \Delta \|\phi\|$  entails  $\|\phi'\|$ ; otherwise  $\|\mathbf{O}_{\Delta} g\phi\|$  is undefined.

Where  $\phi'$  is identical to  $\phi$  , with all occurrences of  $g$  removed.

[Chierchia 2001, ex. 116]

This gives us strengthening, and it is clear from all the previous discussions that it can only fulfilled in a DE context. While this connection seems straightforward, it is not explicit,

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indicating that is in fact a marked item in the sense of introducing semantic characteristics lacking from plain indefinites, it need not be the case that strengthening is the one that puts it into a paradigmatic relationship. Rather this could be an epiphenomenon of what the actual properties of *any* are in connection with independent principles. (This, I think, can be inferred from Krifka's account.) Furthermore, there are cases where *any* is fully appropriate, but plain indefinites are excluded, in particular contexts, where *any* acquires a quasi-universal meaning (see Lee&Horn 1994, Horn 2000a). And finally, I take *some* to be at least equally marked as *any*, with a meaning not being directly comparable.

<sup>7</sup> “To put it differently, an NPI, on the present modified view, does not necessarily signal an actual, specific domain expansion; it signals, rather, willingness to expand the domain...” [Chierchia 2001: 34]

<sup>8</sup> “Second, this domain extending function must be universally closed at some point in the derivation. Crucially, such an operation of quantificational closure is subject to a condition (or, if you wish, carries a presupposition). Its result must lead to something stronger than the corresponding meaning with a plain indefinite.” [Chierchia 2001:34]

yet. In order to ground universal closure and tie it to the relevant licensors, Chierchia introduces a mapping condition, which states that the two relevant domains are mapped onto each other.

(30) The domain of a +DE head maps onto the scope of **O** [Chierchia 2001, ex. 119]

Although this seems intuitively on the right track, it has to be noted that it is a stipulated requirement, which has the perhaps not so desired effect of binding the locality of NPI licensing to the first licensor to occur in the structure. Nevertheless, although the whole account relies on domain extension and is restricted in a way to *any* concurring with plain indefinites, and despite of the fact that Chierchia finally ends up with a morpho-syntactic feature tied to NPIS, we can use the core idea of implementing quantificational domains for restricting the locality of NPI licensing. But first, consider again the cases where licensing could not apply once and forever: when the licensing operator is itself a (non-extreme) scalar item. Then it does not constitute the minimal endpoint of a (negative) scale. (Quantifiers expressing a minimal endpoint are negative quantifiers, Zwarts' anti-additive operators.) With weak negative quantifiers we find ourselves in a situation where the licensing capacity vanishes when the whole structure is further embedded under negation.

- (31) a. Few students read {??even a single / any} book.  
 b. \*Never did few students read {even a single / any} book.  
 d. ??/\*I doubt that few students read {even a single / any} book.  
 c. I doubt that no student read {even a single / any} book.

The same contrast can be reproduced in German by using the complex focus marker *auch nur* (which requires a DE context itself, see section 3.3.3) and either the indefinite *irgendein* (which gives us a weaker variant of an NPI) or, as in the English counterpart, *ein(e) einzige(r/s)*. As one would expect, with the latter judgements are much worse, since it is a bona fide strong NPI. However, with *irgendein*, which does not necessarily invoke a scale of quantities, rather one based on specificity, judgements are much better and clearer. Crucially, when the local licensor *wenige* is in the scope of negation or some other negative element, the sentences are unacceptable, just as if *wenige*, although DE by itself, would act as an intervener. Actually, this is what I assume to be the case. But then the strict locality hypothesis is no longer maintainable. Just one further remark: *few* alone is ambiguous between a proportional and an absolute reading. The former is definitely not DE on its restrictor, since narrowing down the domain could result in a shift of the proportion which turns the truth value into false. Therefore some authors prefer *fewer than n* to illustrate the licensing capacities of this type of quantifier, which has only the absolute reading. The difference can be illustrated with a partitive construction:

- (32) a. \*Few of the students with any interest in semantics read this paper.  
 b. {Few/fewer than 3} students with any interest in semantics read this paper.

But now let us return to the crucial examples. (33a) is the vanilla variant, and we see that the strong NPI expressing an extreme on a quantitative scale is problematic, but the weaker version with *irgendein*, which is almost a direct correspondent to *any* in English, seems quite alright. (33b,c) mess up the locality constraint, a negative quantifier in subject position, or a super-ordinated adversative predicate like *bezweifeln* (*doubt*) reverse the negative scale associated with *few*, and we do get an intervention effect where we should have licensing by the alleged ‘roofing’-constraint, implemented as mapping.

- (33) a. Wenige Studenten haben auch nur {??ein einziges/irgendein} Buch gelesen.  
 ‘*Few students read {??even a single / any} book*’  
 b. \*Nie haben wenige Studenten auch nur {ein einziges / irgendein}  
 Buch gelesen.  
 ‘*\*Never did few students read {even a single / any} book.*’  
 d. \*/??Ich bezweifle, dass wenige Studenten auch nur {ein einziges / irgendein}  
 Buch gelesen haben.  
 ‘*\*/??I doubt that few students read {even a single / any} book.*’  
 c. Ich bezweifle, dass kein Student auch nur {ein einziges / irgendein} Buch  
 gelesen hat.  
 ‘*I doubt that no student read {even a single / any} book.*’

It could be shown in chapter 1 that the difference between (26) and (31/33) lies in the way scalar implicatures are computed for the licensing elements themselves. There are two possibilities to explain these facts. One line of argumentation would be that *few* acts as an intervener for the higher negation, and we have seen that the effect that intervening elements have that they create scalar implicatures on their strong meaning where the NPI ceases to be licensed. On the other account it cannot be interpreted as a DE quantifier in connection with a higher negation or other negative element, thus the NPI would not be licensed by it, and for the higher potential licenser we have to claim that it is excluded. This exclusion, however, cannot be achieved by Chierchia’s mapping hypothesis, since the relevant licenser closer to the NPI would not be DE, hence we need intervention on both accounts. On the second option, where *few* changes its meaning properties under negation, it would relate to a non-DE quantifier (*many* or *more than few*). Notice, that on the intervention scenario, following Chierchia’s algorithm, we lose the implicature which entails an existential statement (*few*, but not *none*), but we get an indirect implicature in the reverse direction (not *few*, but not *more than few/many*). This makes the sentences in the relevant examples run into a contradiction regarding the scalar properties of the NPI.

The computation, however, is very complex. So, although judgements are rather clear, speakers tend to display quite a puzzled face when confronted with examples like these. I will postpone a more thorough discussion on these matters until the end of this chapter.

Before going into detail with NPIS, let us return to our dumpling eating contest, thus considering examples with a plain numeral quantifier. For reasons of linguistic and extra-linguistic context, I will use data for German, and *Knödel* (dumplings) will be our objects of introspection. Remember that what is important about this type of context is that eating *Knödel* presents itself as a monotone increasing function (one after the other). Second, these competitions have just one simple rule: whoever eats most dumplings, wins. Let us assume – under the competition setting – that the number of people who manage to eat *n* *Knödel* will decrease in relation to the number of *Knödel* being actually eaten. This will be important when we consider the semantics of *wenige* (*few*).

- (34) a. Peter hat 5 Knödeln gegessen.

*‘Peter ate 5 dumplings.’*

Scale: <1, 2, 3, 4, 5, 6, 7, 8, ...> direction of entailment: ←

Entailment: Peter hat 4 (3,2,1) Knödeln gegessen.

*‘Peter has eaten 4 (3,2,1) dumplings’*

Implicature by strong meaning: (direct implicature)

Peter hat nicht 6 Knödeln gegessen.

*‘Peter has not eaten 6 dumplings’*

- b. Wenige haben 5 Knödeln gegessen.

*‘Few ate 5 dumplings.’*

Scale: <1, 2, 3, 4, 5, 6, 7, 8, ...> direction of entailment: → (DE)

Entailment: Wenige (wenn überhaupt) haben 6 (7,8...) Knödeln gegessen.

*‘Few (if any) ate 6 (7,8...) dumplings.’*

Implicature by strong meaning: (indirect implicature)

Nicht wenige haben 4 Knödeln gegessen.

*‘Not few ate 4 dumplings.’*

- c. Keiner hat 5 Knödeln gegessen.

*‘No one ate 5 dumplings.’*

Scale: <1, 2, 3, 4, 5, 6, 7, 8, ...> direction of entailment: → (DE)

Entailment: Keiner hat 6 Knödeln gegessen.

*‘No one ate 6 dumplings’*

Implicature by strong meaning: (indirect implicature)

Nicht keiner ( $\approx$  jemand) hat 4 Knödeln gegessen.

*‘Not no one ( $\approx$  someone) ate 4 dumplings.’*

The implicatures are construed after the recipe provided by Chierchia (2001): the scale defines the set of alternatives (since numerals are lexical items and we guaranteed beforehand that they are to be interpreted as being located on a monotonous scale.) The strong meaning is defined as the negation of the formula with the next higher element on the scale, whereas next higher is defined by asymmetric entailment. In addition, the implicature can be generalised for all numerals above the ‘next higher’ element. Under DE operators (such as *wenige* or *keiner*) the primary direct implicature associated with the numeral is cancelled (34a), and new ones are introduced with the full negated formula and a new ‘next higher element’ defined by reversed entailment. (The DE property is responsible for that.)

### 3.3. (Anti-)additive particles

With respect to focus particles which accompany certain types of NPIS, most of them being strong, German is especially interesting, since it has a different set of focus particles for DE and non-DE contexts.<sup>9</sup> What is expressed by *even* in English in both, positive and negative statements is expressed by (at least) three different items in German, of which two are syntactically complex, i.e., they consist of two operative elements, but basically express one single meaning. But before going into detail with these items, we have to discuss the status of *even* in English, since it does not differentiate between the polarity of the context it occurs in. This poses several interesting questions regarding the meaning of *even*, and also pertains to the longstanding debate, whether the different behavior of an item like *even* should be captured by assuming a double lexical entry, or whether it is possible to define a single semantic specification, which can be taken to express also the sensitivity to DE-ness. Since one of our major aims is to follow Grice’s Modified Occam’s Razor “*Senses are not to be multiplied beyond necessity*”, it would be appreciable to find a way to accommodate the two uses of *even* into one lexical entry with a unified meaning. Another question, addressed in a very interesting way by Rullmann (1997, 2003), is whether *even* comes with a presupposition, and how this presupposition can be expressed.

#### 3.3.1. ‘Even’ in DE contexts

For a more detailed discussion, whether there should be two or one lexical entries for *even* in English, see Rullmann (1997). Although there are arguments against an analysis of the two usages of *even* with identical meaning in terms of different scope at LF (see Wilkinson 1993, 1996), the idea that *even* comes in a positive and in a NPI-like variant (as argued for by Rooth 1985, von Stechow 1991) must be handled with care. The principal problem for

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<sup>9</sup> See König (1991) for an extensive discussion of focus particles.

*even* is that it seems to associate with a reverted scale under DE contexts. On the other hand, it is argued that the scale associated with *even* is presupposed (see Horn 1969, Lee & Horn 1994), and marks the item in focus as the least likely among its alternatives.

- (35) John didn't even invite [<sub>F</sub> Bill]. [Rullmann 1997: 43]
- a. ⇒ Bill is the most likely to be invited.
- b. ⇒ Bill is the least likely not to be invited.

Presuppositions, however, do not change under negation (or other DE operators), they are claimed to project beyond such operators, or in other terms, DE-operators, negation, but also other clausal operators behave as 'presupposition holes' (Heim 1992). Actually, there are two distinct presuppositions associated with *even*. One is the scalar one already mentioned, and the second one has the flavor of an existential presupposition and states that at least for some elements of the alternative set, the proposition expressed by the formula without *even* must be true. Both of them must be viewed in a critical way, the arguments why they are not really the same kind of presuppositions we commonly talk about will be elaborated below. Let us first tackle the scalar presupposition part. A theory which assigns widest scope to *even* (with respect to scale reversing operators, i.e., Wilkinson 1996) is doing fine when one has to define the scalar presupposition, it is always the same and conforms to what we have already mentioned in other contexts. However, there are various problems with such an account.<sup>10</sup> First, other focus particles such as *only* or *usually* are sensitive to negation even with respect to what the sentences are to assert. Second, in languages, which have two distinct items (like German or Dutch), scope determines which of those items has to be chosen. The third problem is wide-scope assignment itself, since it neither obeys (various) island constraints, nor does it happen freely: it only applies if a DE-operator is present. I think that these conceptual arguments are the most compelling ones. For illustration, consider the following sentences.

- (36) a. They even hired no linguist who had read [<sub>F</sub> Syntactic Structures].
- b. They hired no linguist who had even read [<sub>F</sub> Syntactic Structures].
- [Rullmann 1997: 49]

The two readings Rullmann gives for sentence (36b), where syntactically *even* occurs in the relative clause, differ in the assumptions about likelihood of 'having read Syntactic Structures'. On the more plausible reading, linguists are taken to be very likely to have read Syntactic Structures, and this reading corresponds to the alleged wide-scope

<sup>10</sup> Again, see Rullmann (1997) for detailed discussion. Basically I present his argumentation here on the debate between wide-scope *even* and a two lexical entries stand. I will depart from his analysis on the re-interpretation of scalar presuppositions as scalar implicatures.

interpretation, identical to (36a), whereas the second would be analyzed as *even* remaining in the relative clause. So, in certain contexts, such as negative quantifiers, it has to be assumed that *even* scopes out of the relative clause and over the negative quantifier. Both are known to be islands, the first a strong one, blocking also all sorts of syntactic movement operations, the second at least for LF-movements (cf. Beck 1996 among others). Other quantificational items, such as *each*, which are known to prefer wide scope readings, cannot acquire this wide scope interpretation in a context like this:

- (37) a. They hired no linguist who had read each of Chomsky's books.  
 b. Each of Chomsky's books is such that they hired no linguist who had read it.  
 [Rullmann 1997, ex. 28]

Sentence (37a) cannot have an interpretation which would correspond to the clefted structure in (37b). Now compare the following sentences with a plain indefinite (or definite) determiner instead of the (DE) negative quantifier:

- (38) a. They hired a/the linguist who had even read [<sub>F</sub> *Syntactic Structures*].  
 b. They even hired a/the linguist who had read [<sub>F</sub> *Syntactic Structures*].  
 [Rullmann 1997, ex. 30/31]

Both determiners are not downward entailing, and the two sentences clearly have different interpretation, depending on the (surface) scope of *even*. As a last example, Rullmann provides a structure, where narrow-scope *even* is supposed to scope out, again, since it would be "attracted" by matrix negation. In that configuration it really depends, what operators intervene between negation and the focus particle, an indefinite allows *even* to take wide scope, while an intervening definite determiner seems to globally block scoping out.

- (39) a. They didn't hire the linguist who had even read [<sub>F</sub> *Syntactic Structures*].  
 b. They even didn't hire the linguist who had read [<sub>F</sub> *Syntactic Structures*].  
 [Rullmann 1997, ex. 33]

All these properties are reminiscent of NPI licensing, but not of taking wide scope by quantificational elements. The solution may be that in the case of *even*, what is taken to be a scalar presupposition is derived from a conventional implicature (as originally proposed by Karttunen & Peters 1979). And this implicature is recalibrated in the scope of a DE-operator, much in the sense of Chierchia (2001). What is presupposed indeed, is the scale itself and the requirement that the statement with the item in focus is interpreted as the least likely with respect to its alternatives (if we parallel the recalibrated scale at the DE-operator with the apparent wide scope reading). On the other hand, in order to save the

unique lexical entry hypothesis, one could claim that *even* comes only with a scale, and whatever direction of asymmetric entailment is activated on that scale, the item in the focus of *even* must mark an endpoint, be it maximal or minimal. (This would correspond more to Fauconnier's views.) But as Rullmann notes, it is merely impossible to construe an argument that would invariably distinguish between the wide-scope account and the analysis which invokes a plain and a NPI status for *even*. But if we treat the scalar presupposition not as a presupposition proper, but as a conventional implicature, the whole discussion loses its relevance. In fact we expect scale reversal in DE contexts. One problem remains, and this has to do with the fact that implicatures may easily be cancelled through the context, or explicitly, but presuppositions not. There is one caveat to this claim: cancellation must only occur in the context of increased universality. So for example, scalar implicatures in the sense of Chierchia may be cancelled (or excluded):

- (40) John ate five dumplings, if it were not six or seven [←added context=cancellation]  
 ⇒ John didn't eat six dumplings.

The scalar presupposition (or implicature) associated with *even* may not be cancelled or removed. However, I think this has rather to do with general principles of pragmatic assertion than with the specific nature of implicatures: if something asserted is the least likely, it is clear that one makes a stronger statement than one could make with one of the alternatives under considerations. The assertion is justified then, but removing that relation of strength explicitly pulls the carpet out from underneath the assertion itself. For demonstration, consider the following sentence, where the following clause invites a reaction like "So what, then?"

- (41) #They even invited [<sub>F</sub> John], if it were not very likely to invite him.

What is going on here may shed some additional light on the generation of various kinds of presuppositions in general. In the case at hand, we have a presupposition that comes out as a scalar implicature, thus being sensitive to scale reversal under DE operators. We need not assign different scopes to *even* itself, as was suggested by Wilkinson (1996). It is *even* being in the (immediate) scope of DE operators that triggers scale reversal. In contrast to other scalar implicatures (which are generated in order to get stronger statements), this type of scalar implicatures identifies the item in focus to give the strongest (least likely) statement, removing this implicature from the interpretation of a sentence would automatically weaken this statement, which goes against pragmatic principles. In addition to these considerations, what is really presupposed is that *even* marks some endpoint on a scale. Presupposed here may also be too strong a formulation, since I take this property to be the actual meaning of *even*, which may be traced back diachronically as the



grammaticalisation of a metaphoric use of an adjective, whereas this plain meaning of *even* still exists.<sup>11</sup>

The other type of presupposition associated with *even* is an existential one, expressing the fact that at least some propositions with alternatives must be true. It was criticized and abandoned altogether by Krifka (1991) and von Stechow (1991) on the basis of examples such as (42), where an existential presupposition (that Bill danced with someone else) would plainly contradict the assertion of *only* (that there was no one else except Sue who Bill danced with).

(42) Bill even danced only with [<sub>F</sub> Sue]. [Rullmann 1997, ex. 49]

Rullmann (1997) shows that the existential presupposition, which is felt to arise in many cases, is better viewed “as a pragmatic entailment of the scalar presupposition of *even* combined with the assertion expressed by the sentence in which *even* occurs, given some further plausible assumptions about the use of *even*.” [Rullmann 1997:58]. This is quite plausible in the light of scalar presuppositions being sensitive to DE-ness. A good example for this effect are factive complements of adversative predicates.

(43) Mary didn’t even invite [<sub>F</sub> Bill]. [Rullmann 1997, ex. 56]

(44) I am sorry I even [<sub>F</sub> opened] the book. [Rullmann 1997, ex. 57]

In (43) the scalar presupposition of *even* is that the proposition “Mary invited Bill” is the most likely among its alternatives. The sentence asserts that the proposition is false, therefore the hearer may conclude that all less likely alternative propositions are false, too. Under the scalar conventional implicature approach, one would rather include the DE-operator and order the statements from least likely = strongest to more likely (weaker, hence entailed). Then the proposition “M. didn’t invite Bill” directly entails that she didn’t invite other people as well. Things are a bit different with factive complements. In (44) “I opened the book” must be true, and it constitutes the most likely proposition among the

<sup>11</sup> The German kin of *even* – ‘*eben*’, which has a similar, although not identical meaning in its lexical useage, is not grammaticalised the way *even* is. It can be used as a temporal adverbial, similar to temporal *just*, or as a discourse particle, indicating that the assertion under consideration is assumed to be part of the common ground already. This would in principle violate the pragmatic principle of informativity, however, what is conveyed with *eben* is emphasis on the relevance of the assertion in the context of reasoning. This might be the reason, why we find this usage of *eben* very often in causal clauses, and also, why it is often, but not necessarily accompanied with verum focus. When focus falls on some other constituent, then the ‘causal’ emphasis moves towards the item in focus, not surprisingly.

i. Peter IST eben am Kilimandscharo gewesen.  
 ‘Peter HAS just now been on Mt. Kilimandjaro.’  
 ‘...viz. Peter HAS been on Mt. Kilimandjaro.’

alternatives. Hence, no inferences can be drawn regarding alternative propositions of the form “I X-ed the book”. Including the matrix predicate into the scalar presupposition gives us the right scale (with ‘least likely’ as the endpoint), but what can be inferred is only that presumably I would be sorry if I did something more substantial with the book than just opening it (e.g. reading the first 2 pages.). Regarding whether I actually did something else with the book, nothing can be deduced in that constellation. This is a very clear indication that what has been termed as an existential presupposition is in fact nothing more than an inference. However, in simple positive contexts this inference can always be drawn, and this is why it has the flavour of a presupposition.

To sum up, *even* marks an endpoint of a scale. This basic meaning might be historically deduced from its lexical meaning of ‘plain’ in opposition to other more or less uneven textures or formations. However, the direction of the scale is not fixed by itself, what is fixed is that the item in the scope of *even* gives us the strongest proposition relative to some local domain of assertion. In that respect *even* mimics the syntactic and semantic behavior of polarity items. If it is in the immediate scope of a DE-operator, its scale will be reversed in order to fulfill the condition that the endpoint marks the strongest proposition to be asserted. Certain arguments have been presented that it cannot be the scope of *even* itself that must be over the DE-operator, although, as already committed by Rullmann (1997) it seems to be impossible to construe theory independent arguments that would invariably exclude the wide-scope hypothesis. The arguments presented by Rullmann are based on general assumptions regarding constraints on (LF-)movement, viz. scope assignment and on the fact that only DE-licensors trigger outscoping, but still accompanied with locality constraints known from NPI licensing. This seems to favor an analysis which discerns two types of *even*, one for positive contexts (just as *sogar* in German) where the scalar presupposition involves least likelihood, and one for DE contexts (NPI-*even*, like *auch nur* or *nicht einmal* in German), with a scale the endpoint of which is associated with the most likely proposition. I have tried to show that if we relax our notion of scalar presupposition, we are no longer forced to assume lexical ambiguity between these two types of *even*. The idea is that it is not an out-of-the-blue kind of presupposition, that is associated with each of the two *evens*, but actually the core meaning of a single grammaticalised focus sensitive operator: it distinguishes the item in focus as the one element within the relevant set of alternatives (ordered on a scale of likelihood) that gives us the strongest statement. Notice that this scalar ordering is not necessarily tied to propositions, it can also be simple entailment relations on some quantitative scale, or even some purely pragmatically determined scale of relevance, as can be shown with the following examples.

- (45) a. Ed has two children and Fred even has [<sub>F</sub> three].  
 b. Claire is even an [<sub>F</sub> associate] professor.

As far as existential presuppositions are concerned, which have been disputed for a long time, Rullmann (1997) already showed convincingly that these are better viewed as pragmatic inferences. By doing so it falls out naturally that in certain contexts they plainly do not exist but in others they obligatorily do.

In DE contexts *even* has the function to mark the item, which gives us the strongest meaning among the relevant set of scalar alternatives. What hasn't been noticed so far is that the scale gets truncated in non-DE contexts. In (45a) the relevant set of alternatives contains the numbers 2, 3 (and presumably 1 as well, although not explicitly stated in the context of the first conjunct, however, one can simply derive it by entailment.) Higher numbers are excluded from the set of alternatives, either because they would violate the meaning of *even*, or because they are excluded due to a scalar implicature in the sense of Chierchia. The second option seems more plausible, since the scalar implicature can be cancelled, however, I assume that this implicature removal happens outside of the domain of assertion where *even* resides. Suppose the speaker does not know Fred very well, then a sentence like the following clearly is felicitous.

(46) Fred has even 3 children, if not 4.

In DE contexts, the necessary process of truncation seems to be not so easily available. Although judgements are rather subtle, I find that the second sentence of the following pair is slightly marginal.

- (47) a. None of our colleagues has 5 children, but Fred doesn't even have one.  
 b. ??None of our colleagues has 5 children, but Fred doesn't even have four.

This may have to do that scales of quantity are open-ended in the upward direction, but have a minimal endpoint downwards: one single object. And in DE contexts with a reversed scale, the associated endpoint is strongly preferred to coincide with the real endpoint on the scale. This pertains only to scales of quantity, but it is remarkable, since it gives us another hint, why an item like *even* is most likely to be directly associated with (strong) NPIS, since it makes explicit what the NPIS semantic contribution is to the overall assertion.

### 3.3.2. German 'sogar' as a PPI

As already mentioned, *sogar* in German corresponds to *even* in non-DE contexts. It cannot be used in DE-contexts, or if it occurs in the scope of negation or other negative operators, it gives rise to a meta-linguistic interpretation.

- (48) a. \*Niemand hat sogar [<sub>F</sub> Syntactic Structures] gelesen.  
 %‘Noone has even read syntactic structures.’
- b. Peter hat nicht SOGAR Syntactic Structures gelesen, es war eines der ersten Bücher, die er gelesen hat.  
 ‘Peter did not EVEN read Syntactic Structures, it was one of the first books he read.’

When the negative element is higher in the structure, such as an adversative predicate, the meta-linguistic flavor gets leveled, and we rather get an interpretation where what is the complement of a verb like for example *doubt*, is an independent assertion, hence interpreted as factive, already established in the discourse, and the main predicate only asserts the subject’s attitude to the whole proposition. With verbs, which normally do not carry along factivity, we lose the capacity of neg-raising (Horn 1978). Crucially, Syntactic Structures is interpreted as the least likely book Peter could have read, regardless whether it is embedded under an adversative predicate or not.

- (49) a. Ich bezweifle, dass Peter sogar Syntactic Structures gelesen hat.  
 ‘I doubt that Peter even read Syntactic structures.’
- b. Ich glaube nicht, dass Peter sogar Syntactic Structures gelesen hat.  
 ‘I don’t think that Peter even read Syntactic structures.’

Interestingly, we can reproduce the NPI-*even* meaning in German with *sogar*, but only when *sogar* scopes over the DE-operator: the item in focus is then interpreted as the most likely element. Notice, however, that also the object (in focus) must be scrambled over negation.

- (50) a. Peter hat sogar [<sub>F</sub> Syntactic Structures] nicht gelesen.  
 ‘Peter even didn’t read Syntactic Structures.’
- b. \*Peter hat sogar nicht [<sub>F</sub> Syntactic Structures] gelesen.

This may have to do with the fact, that in German association with focus is normally accompanied with the requirement that the constituent containing the focus be adjacent to the focus marker. Still, as the following sentences show, this is strongly preferred, but it is not absolutely clear whether it is mandatory. One has to be careful how to test association with focus. Sentence (51b) may have an interpretation, where the focused constituent actually is the whole VP (or whatever label wants to use), including the indirect object and the direct object, which – as the ‘deepest embedded’ constituent – receives default stress. And to my intuition (51c) is as marginal as the example with negation, maybe even worse, because in (50b) one possibly could construe a reading, where ‘not read Syntactic Structures’ is the action which is evaluated against other alternative actions, while in (51c)

another constraint is violated. Scrambling often indicates that focus goes to the constituent the other, originally deeper constituent is scrambled over. One could call this kind of movement de-focusation. If *sogar* could associate with an item lower in the structure, where a scrambled constituent also were allowed to intervene, then (51c) should be fully acceptable, but it is not.

- (51) a. Peter hat den Studenten sogar [<sub>F</sub> Syntactic Structures] zum Lesen gegeben.  
 ‘Peter gave the students even Syntactic Structures to read.’
- b. ?Peter hat sogar [<sub>F</sub> den Studenten \*<sub>F</sub> Syntactic Structures] zum Lesen gegeben].
- c. \*Peter hat sogar Syntactic Structures [<sub>F</sub> den Studenten vom ersten Jahr] zum Lesen gegeben.  
 ‘Peter even gave the first year students Syntactic Structures to read.’

This is not to say that negative elements could not be in the scope of *sogar* themselves. In addition to that, the other DE-dependent variants of *sogar* may be used to re-enforce the targeted meaning.

- (52) a. Er war sogar nicht (einmal) im Kino.  
 ‘He even wasn’t in the cinema.’
- b. Er hat sogar nicht einmal auch nur aufgeschaut.  
 ‘He didn’t even look up.’

What remains to explain is why *sogar* behaves like a PPI in that it does not allow a DE operator to scope over it. I believe that in the case of *sogar* we are really dealing with an existential presupposition (and negation or DE operators within the scope of *sogar* are part of that presupposition.) One hint to the question, how this presupposition arises may be in the morpheme *so*, which in isolation can be used as a manner adverbial with a meaning paraphraseable as “particularly that way.” If one denies that something happened in a particular way, the presupposition that something happened remains untouched, unless one permits to change or accommodate the common ground. (See von Stechow 2003, who gives examples for accommodation introduced by “Hey, wait a minute, I didn’t know that...”) To indicate accommodation in the following (b.) example, the consequent contradicting the presupposition is marked with a percentage sign.

- (53) a. Er hat das so gemacht.  
 ‘He did it that way.’
- b. Er hat das nicht so gemacht, sondern {anders / % gar nicht}  
 ‘He didn’t do it that way, but {in a different way / %not at all}.’

The second morpheme in *sogar* can be used as a particle, but in its lexical meaning *gar* can be translated as “cooked through”. Its basic meaning can be taken to also express aspectually an endpoint to the process of cooking. In its grammaticalised form as a particle it occurs most likely with negation or negative quantifiers: *gar nicht* (‘not at all’) / *gar nichts* (‘nothing at all’), or with weak quantifiers quantifiers (*gar viele/wenige* ‘quite many/few’), as an intensifier of properties or in questions, indicating a lowered threshold of applicability or likelihood. In the first of the following examples, we see that *so* may be also used as a discourse particle on its own, which only expresses some emphasis (together with an existential presupposition). In (54c) *Syntactic Structures* is taken to be among the less likely books to read. The question almost gets a rhetorical reading expressing disbelief by the speaker (i.e., expecting a negative answer.)

- (54) a. Er hat (so) *gar nichts* getan.  
           ‘*He did nothing at all.*’
- b. Er ist ein *gar genialer* Linguist  
           ‘*He is a quite congenial linguist.*’
- c. Hast du *gar Syntactic Structures* gelesen.  
           ‘*Did you even read Syntactic Structures?*’

*So* and *gar* two together take the relevant parts of their meaning and constitute a focus particle which corresponds to anti-DE *even*: the item in focus must be an endpoint, and there is also an existential presupposition.

Slowly returning to our discussions of strong NPIS, we will have to have a closer look onto the pendant to NPI-*even* in German – *auch nur*, which in most cases obligatorily shows up with idiomatic (strong) NPIS.

### 3.3.3. German ‘*auch nur*’ as a (weak) NPI

In a language like German (but also Dutch, see Rullmann 1996, 1997), we find a split between particles reserved for positive contexts, and particles occurring only in DE contexts. *Sogar* corresponds to *even* in non-negative (or non-DE) contexts. The complex item *nicht einmal* (not to be confused with a co-occurrence of the two words, where each of them has independent meaning, specifically *einmal* means *once*) would be *not even*, but here negation is an integral part of this item. Most interesting is the complex *auch nur*, which corresponds to *even* in DE contexts in English. The basic difference is that *sogar* is reserved for upward entailing contexts, and in the scope of negation it enforces a

metalinguistic interpretation of negation, whereas *auch nur* crucially depends on DE contexts.<sup>12</sup> Consider the paradigmatic sentence of the previous section in German.

- (55) a. ??Sie haben sogar keinen Linguisten eingestellt, der [<sub>F</sub> Syntactic Structures] gelesen hat.  
 ‘They even didn’t hire a linguist who has read *Syntactic Structures*.’
- b. Sie haben nicht einmal einen Linguisten eingestellt, der [<sub>F</sub> Syntactic Structures] gelesen hat.  
 ‘They didn’t even hire a linguist who has read *Syntactic Structures*.’
- c. Sie haben keinen Linguisten eingestellt, der auch nur [<sub>F</sub> Syntactic Structures] gelesen hat.  
 ‘They didn’t hire a linguist who has even read *Syntactic Structures*.’

It is a bit tricky to figure out the relevant interpretations for these sentences. (55a), though a bit marginal, has an interpretation where *Syntactic Structures* is the most likely linguistic book to read. What it asserts is that ‘they didn’t hire any linguist, not even one who (presumably) has read only *Syntactic Structures*’. The slight oddness may stem from the fact that *sogar* cannot associate properly with the whole constituent ‘no linguist’ and establish an alternative set containing other scientists more likely not to be hired. It has to associate into the restrictive relative clause, which in principle is possible, but the associated element itself resides within a DE context, and the alternative set is taken to vary upon books potential linguists may have read, and not upon linguists. Since ‘*Syntactic Structures*’ is taken to be the most likely book, no inferences can be drawn directly, and this violates the existential presupposition requirement we have discussed in the previous section. This requirement is not applicable in (55b), on the contrary, since it is negation (made emphatic with *einmal*) that associates with the focus located in the relative clause, all the relevant structure is within the immediate scope of negation, variation upon linguists is taken to be the natural interpretation. In (55c) *auch nur* has narrow scope with respect to negation. Here, the interpretation shifts onto one where *Syntactic Structures* should be regarded as the least likely book to be read, which is pragmatically odd, but it can also be interpreted in a way that it is the book with the least relevance towards reasons not to hire that linguists. The sentences conveys a meaning where a certain type of linguist is

<sup>12</sup> Of course, there is also another meaning to the co-occurrence of *auch* and *nur* (compositional in a common sense). But first, this has to be marked prosodically by giving extra stress on *auch* (i.) indicating that *auch* actually associates with the topicalised subject, and secondly, the two may easily be separated by syntactic processes, such as VP-topicalisation (ii.).

- i. Der Hans<sub>1</sub> ist AUCH<sub>1</sub> nur<sub>2</sub> [ins Kino gegangen]<sub>2</sub>.  
 ‘John only went to the cinema, too.’
- ii. [Nur ins Kino gegangen] ist auch der Hans.

excluded from being hired, and presupposes a scientific society hostile towards any generative theory. Having read Syntactic Structures is good enough a reason not to be hired at all. This corresponds to the narrow scope interpretation of *even* invoked by Wilkinson (1996) and discussed Rullmann's (1997) paper. The reason why *auch nur* cannot have a wide scope interpretation is clear – it has to be in the scope of a DE operator, a more thorough explanation is about to follow. But why is that narrow scope interpretation not synonymous with a wide-scope reading with a different focus marker like *sogar*. I assume that this is not possible for the same reasons why (55a) is odd. Variation within the alternative set is not exactly upon certain books, but upon certain types of linguists identified by the literature they have read. In terms of licensing, this is still fine, since *auch nur* is only sensitive to the immediate scope requirement.

### 3.3.3.1 Focus in scalar contexts

Now let us turn to the semantic properties of the DE sensitive focus particles in scalar contexts. Since the complex item *nicht einmal* already contains negation, we want to concentrate on *auch nur*. As a first generalisation, it seems that it depends on DE contexts. Let us demonstrate this with our scales consisting of numerals from the example in (34).

- (56) a. \*Peter hat auch nur 5 Knödeln gegessen.  
 % 'Peter ate even 5 dumplings'<sup>13</sup>
- b. Wenige haben auch nur 5 Knödeln gegessen.  
 'Few have eaten even 5 dumplings'
- c. Keiner hat auch nur 5 Knödeln gegessen.  
 'No one has eaten even 5 dumplings'

Unsurprisingly, (56a) is unacceptable, since *auch nur* surfaces in an UE context. Is there a possibility to explain the peculiar behavior of this focus marker from the meaning of its components? I think it can, the question is whether we need additional assumptions relying on the fact that they semantically form a unit. The lower part of the complex (exclusive) focus particle *nur* ('only') introduces an upward boundary in scalar contexts. It asserts that for any (stronger) alternative the propositional scheme is not true. This means that the scheme is not true for any element on the scale beyond the specified boundary, which in the example at hand is defined by the numeral.

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<sup>13</sup> The English gloss is grammatical, but does not express the meaning of the German sentence, since in non-DE contexts, the operator *sogar* must be used.



- (57) a. Peter hat nur 5 Knödeln gegessen.

*'Peter ate only 5 dumplings'*Assertion:  $\forall n > 5: \neg (\text{Peter ate } n \text{ dumplings})$ Presupposition: Peter ate 5 dumplings.(Entailment:  $\forall n < 5: \text{Peter ate } n \text{ dumplings.}$ )

Notice that the alternatives are construed according to the scale, which in turn is defined via (asymmetric) entailment. An expression in the scope of *nur* is by itself already shielded from scale reversal by a higher DE expression. For example, negation above *nur* only negates the universal associated with the assertion (meaning that not for all alternatives it is the case that the formula applied to them gives a false statement – for at least some of them it will return true.) But the scale the assertion is construed around remains unaffected. That the presupposition does not change under negation is not surprising.

- (58) a. Peter hat nicht nur 5 Knödeln gegessen (sondern mehr).

*'Peter didn't eat only 5 dumplings, (but more)'*Assertion:  $\neg \forall n > 5: \neg (\text{Peter ate } n \text{ dumplings})$ Presupposition: Peter ate 5 dumplings(Entailment:  $\forall n < 5: \text{Peter ate } n \text{ dumplings.}$ )

In order to fulfil the assertion Peter must have eaten at least 6 dumplings, because not eating 6 dumplings would entail 'not eating n' for all other quantities greater than 6. That negation cannot directly scope into the scope domain of *nur* is similar to the intervention effect, which is not so surprising, since there is a covert universal operator intervening. On the other hand one could argue that operators like negation or universals always have a stacked way of scope taking. This corresponds to the locality of NPI licensing associated with these kinds of operators. The following example shows that *nur* can be negated while scoping over a negated constituent itself, consider a constellation, where *nur* is 'surrounded' by two negations. Interestingly, the consequent clause, which specifies which alternatives also give true statements, is almost obligatory. This could be the case because it is conceivable to infer a set of alternatives to a positive object or predicate, e.g., things that Peter has done, but it seems much harder to infer negative predicates. (And with negation present it will be the whole VP that is associated with focus, remember the adjacency viz. constituency requirement we have noticed with *sogar*.)

- (59) Peter ist nicht nur nicht ins Kino gegangen, sondern auch nicht ins Theater.

*'Peter wasn't only not in the cinema, but also not in the theatre.'*

3.3.3.2 *Additive ‘auch’*

For the structurally higher part of the complex operator, *auch* (‘also’/‘too’), the situation is reverse. In a plain sentence with no other (DE-) operators around a proposition containing *auch* states that the item in focus gives a true proposition in addition to propositions with alternatives activated in the context. *Auch*, and its kins are often referred to as additive particles (cf. Altmann 1976, König 1991, Krifka 1998, Rullmann 2003). Therefore the propositions with the alternatives can be taken to be (existentially) presupposed. However, depending on the element in focus, and also on the overall information structure, a scalar presupposition can arise sometimes. This presupposition would express that the element in focus is less likely than all of its alternatives, or even the least expected to hold of the propositional scheme. However, I would not like to claim that this is a fixed part of the meaning of *auch*. On the other hand, a related item, which can be used to reinforce the additive meaning, is the diachronically related item *noch* (*n-+auch*) in German (with possible paraphrases in English as ‘yet another’, or ‘still’), the meaning of which is explicit addition.

As I have indicated, the scalar interpretation is much more marked than with *sogar* (‘even<sub>UE</sub>’), of which it is an integral part, and it shows up most prominently if *auch* is associated to items that are scalar themselves. So, in our example with numeral scales, we need the allusion to likelihood in order to truncate the scale at the numeral under consideration. (However, we could achieve truncation also by application of the strong meaning with a scalar implicature). In the following example, where we use a modal of possibility in order to create a sensible statement,<sup>14</sup> the set of alternatives contains sentences with numerals lower than 5, which are more likely to hold by virtue of asymmetric entailment on the scale itself.

(60) a. (dass) Peter auch 5 Knödeln essen kann.

‘(that) Peter is also able to eat 5 dumplings,’

Assertion: P(5)

Presupposition: P(5<sup>ALT</sup>), and alternatives are ordered with respect to the item in focus according to a likelihood scale with ‘5’ at the low end.

(giving the strongest proposition):  $\forall x . x < 5 : P(x) \subset P(\alpha)$

(Entailment:  $\forall n < 5$ : Peter can eat n dumplings.)

<sup>14</sup> If we had a non-modal sentence with a numeral in the scope of *auch*, such as “*Peter hat auch 5 Knödeln gegessen.*” (‘Peter has eaten also 5 dumplings.’), then any number smaller than 5 cannot be taken to constitute a sensible alternative, since it would be already entailed. The only way to interpret this sentence according to the given pragmatic conditions is that there were different sub-contexts (maybe with different kinds of dumplings), and in one of them he managed to eat 5 dumplings, whereas in some others the number was lower. The modal of possibility used in the example given in the text provides us with such an interpretation in a natural way.

Krifka (1998), citing Altmann (1976), notes that when a potentially scalar item, like pragmatic superlatives, is dissociated from *auch*, the scalar meaning becomes no longer available.

- (61) a. Auch der SCHNELLSTE Computer kann diese Aufgabe nicht lösen.  
       ‘*Even the fastest computer cannot solve this task.*’
- b. Der schnellste Computer kann diese Aufgabe AUCH nicht lösen.  
       ‘*The fastest computer cannot solve this task, either.*’ [Krifka 1998, ex. 12]

Krifka assumes, that in the dissociated variant the associate of *auch*, is interpreted as a contrastive topic (with focus on it), and *auch* gets the (comment-)focus. (For further discussion, see Buring 1997, Rullmann 2003.) To reside in the topic domain has the effect that the set of alternatives is taken to be contextually salient (e.g., a set of computers, neither of them has been capable of solving the task). *Auch* in this case must have a purley additive meaning, just expressing the fact that the item in topic-focus also gives a true statement in addition to the presupposed set of alternatives. (See also Kadmon 2001 for a discussion on terminological and formal issues concerning topic-focus and comment-focus.) There cannot be a scalar meaning, since the set of alternatives is taken to be fixed within the discourse, whereas the scalar interpretation would indicate a universal quantification over an open set of alternatives. In the example above, *auch* has scope over negation, but the example could be construed the other way round with a positive predicate, indicating that the problem under discussion is very easy to solve. (‘Even the slowest computer could solve this problem.’) Scalar uses of *auch* replace the existential presupposition of *auch* with a scalar presupposition: in a sense, it strengthens the presupposition associated with *auch* to a universal statement. This, however, is only possible if the set of alternatives is not determined already in the discourse as a finite set. Crucially, this scalar presupposition will be sensitive to DE-operators having immediate scope over *auch*.

Let us briefly examine, what happens when *auch* is in the scope of negation. In one interpretation, when *auch* bears focus stress, *auch* behaves like a PPI insofar as it turns sentential negation into meta-linguistic (contrastive) negation in the sense of Horn. As indicated elsewhere, I take this use of negation not to be a special case of negation *per se*, but rather a special case of enforcing narrow (contrastive) focus on the item in question. In the relevant cases, there is focus stress on *auch*. In the meta-linguistic sense, the set of alternatives consists of sentences where the element in focus is replaced by elements of the same type or missing altogether. To demonstrate this effect, it is infelicitous to use our example with numeral expressions, since this drives us into a contradiction with the entailment relations of the numeral scale, so let us try something different.

- (62) a. Peter ist gestern auch<sub>1</sub> [ins Kino gegangen]<sub>1</sub>.  
 ‘Yesterday Peter also went to the cinema’
- b. Peter ist gestern nicht AUCH<sub>1</sub> [ins Kino gegangen]<sub>1</sub> – es war das einzige was er den ganzen Tag getan hat.  
 ‘Yesterday Peter did not ALSO go to the cinema – it was the only thing he did the whole day.’

Notice that it is merely impossible to have a contrastive topic, since it can neither associate with negation having scope over *auch*, nor with *auch* being in the scope of negation. Judgements are not so clear, however, perhaps due to the complexified information structure. In the following example, I use numeric indices to indicate association with focus and affixed / and \ to indicate rising, respectively falling accent. Focus stress is marked by capital letters.

- (63) a. /[Ins Kino gegangen]<sub>1</sub> ist Peter gestern AUCH\<sub>1</sub> t<sub>1</sub>.  
 ‘Yesterday Peter also went to the cinema’
- b. ??/\* /[Ins Kino gegangen]<sub>1</sub> ist Peter gestern nicht AUCH\<sub>1</sub> t<sub>1</sub> – es war das einzige was er den ganzen Tag getan hat.  
 ‘Yesterday Peter did not ALSO go to the cinema – it was the only thing he did the whole day.’
- c. ??/\* /[Ins Kino gegangen]<sub>i,2</sub> ist Peter gestern NICHT\<sub>2</sub> auch<sub>1</sub> t<sub>i,1</sub> – es war das einzige was er den ganzen Tag getan hat.  
 ‘Yesterday Peter did not ALSO go to the cinema – it was the only thing he did the whole day.’

Back to (62b), contrastive negation asserts that the sentence is not true with respect to the presence of *auch*. The truth of the sentence without *auch* is presupposed in the sense of a focus–presupposition distinction. However, what is actually refuted by this sentence is that the sentence should also be true for its alternatives, so the relevant alternative for this kind of contrastive focus would contain a focus operator like *only*. In a sense, in order to use negation in a sentence like this, the sentence without negation must be taken to be already established in the context. This kind of contrast is sometimes also called ‘correction focus’. Contrastive negation/narrow (correction) focus on *auch* is one option, but not the only one. Suppose we use a negative quantifier instead, and enforce focus within the VP in order to control association with focus.

- (64) Niemand ist gestern auch<sub>1</sub> ??(noch<sub>1</sub>) [ins KINO]<sub>1</sub> gegangen.  
 ??‘Yesterday nobody also went to the cinema’

This example is slightly marginal, and without the addition of *noch* it sounds quite odd. This may be due to the presupposition of *auch*, that the formula (the background to the

item in focus) is true for all relevant alternatives. A negative quantifier in subject position also binds the situation variable, indicating that the predicate of the sentence is not instantiated by anyone.<sup>15</sup> This in turn weakens the accessibility of alternatives. Adding *noch*, which expresses an implicit (temporal) ordering (of events in our case) makes it easier to access alternatives prior to the situation, where going to the cinema was under discussion. The intended interpretation is quite clear. What is in focus is either the whole predicate ‘go to the cinema’, or just the directional argument ‘to the cinema’. What is peculiar about such a constellation is that due to the presupposition of statements with the alternatives, the quantifier *niemand*, which consists of an indefinite plus incorporated negation, has to be interpreted with a specific restriction set. (64) has a meaning roughly paraphrased as “Of the people we have been out with yesterday, there was none who also went to the cinema in addition to all the other things we did.” Hence, we get negated what would be transported as the assertion, the proposition with the item in focus. But the presupposed propositions with the alternatives have to remain valid. The specificity on the negative subject in the alternatives is peculiarly interesting, and I suppose that there is a connection between focus, which associates the VP-predicate with *auch*, which excludes the subject, and the topic status of the negative quantifier, which cannot be interpreted as a contrastive topic. The same kind of analysis pertains to other DE operators, the discussion of which I will spare here.

Just one side-remark on the empirical data. Due to the possibility of reconstruction of the subject (as a contrastive topic) into the scope of *auch*, one has to make sure to assign the operator *auch* the right LF-scope, the VP ‘*ins Kino gegangen*’. Prosodically this is marked by normal focus stress (broad/wide focus) on the deepest embedded constituent – *Kíno*. And also, in order to associate the subject with a syntactically lower *auch*, one is forced to employ the rise-fall contour described in the literature (cf. Jackendoff 1972, Büring 1997, Krifka 1998), where *auch* receives a falling accent indicating comment-focus. This option, however, is not available for *nur*, and more restricted and with different

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<sup>15</sup> In English, the particle *also* seems to come along with an existential presupposition on the item in focus, much like *sogar* in German, thus resisting the scope of negation. In that respect it differs from the additive post-VP particle *too*, which is fine within the scope of negation, as long as its presupposition can be satisfied. (See Rullmann 2003 for detailed discussion.)

Mary ate the lasagne, but

- i. \*she couldn’t also eat the spaghetti.
- ii. She couldn’t eat the spaghetti, too.

[Rullmann 2003: 389]

Notice that both of these items contain the morpheme ‘so’, which I take not to be a coincidence, although I will not attempt any further to deduce any particular regularity from this perhaps diachronically motivated isomorphism. But interestingly enough, the determiner ‘some’ in English in a certain way shares this property, too. (Eva Dobler casted some doubts on those speculations, though, by asking me whether *sober* would also fit into that paradigm...)

information structure for *sogar* (falling accent on the topic constituent, no special accent on *sogar*, as if the topicalised constituent would carry its normal emphatic stress along.)

- (65) a. /Hans<sub>1</sub> ist gestern AUCH<sub>1</sub>\ ins Kino gegangen.  
 b. \*/Hans<sub>1</sub> ist gestern NUR<sub>1</sub>\ ins Kino gegangen.  
 c. \*Hans<sub>1</sub>\ ist gestern sogar<sub>1</sub> ins Kino gegangen.  
 d. Hans<sub>1</sub>\ ist sogar<sub>1</sub> gestern ins Kino gegangen.

Returning slowly to the combination of *auch* and *nur*, on first sight it seems clear why a combination of the two results in a contradiction in upward entailing contexts. The presupposition of the expression with *nur* have different truth values, as indicated in (57), which contradicts what is asserted by *auch*, which presupposes true statements with alternatives. However, I think that the combination of the two elements is not a plain merge of the set of constraints associated with each of them. Rather it comes out as a result of embedding *nur* under *also* with the proviso that they take scope over the same focus domain, hence associate with the same item.

### 3.3.3.3 *The semantic properties of ‘nur/only’*

But first, it is necessary to have a closer look on the semantics of each of the operators. Let us start with *nur/only*. Wagner (2005) has shown that in order to account for various facts, three distinct domains have to be discerned: the syntactic scope, which may be a specific constituent (DPs in the most prominent cases) or the VP (when *only* is attached to syntactic structure as a sentence adverbial). Secondly, the semantic restrictor of *nur/only*, and third the semantic focus. Crucially, the semantic restrictor must contain the item in focus, but it may be larger than the focus itself. Wagner convincingly shows that, one has to employ a twofold strategy in order to explain the peculiar behavior of NPIS in connection with *only*. While association with focus can be analysed in accordance with Rooth (1985, 1992, 1999) as involving a semantic rule which determines the properties of the set of alternatives, one has to also assume that the constituent representing the restriction of *nur/only* moves to the complement position of the operator.<sup>16</sup> This movement account is necessary to explain why association with focus itself is not island-sensitive, but together with NPI licensing, we see

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<sup>16</sup> See also von Stechow (2002) for an approach that has a different (purely semantically based) implementation, but aims at explaining the same facts. Herburger (2004) made quite similar claims about the LF-structure of *only*, in particular she emphasises the constituency of *only* with its restrictor, which contradicts Büring & Hartmann’s (2001) analysis about sentence-initially occurring focus particles.

that whenever the NPI ends up in the restrictor of *nur/only* it is not licensed.<sup>17</sup> First consider cases with VP-*only* where the NPI may remain in the scope of *only*, which has been shown to be at least Strawson-downward entailing (von Stechow 1999). Departing from Wagner's conventions, I use square brackets to indicate the syntactic scope, underline for the restriction of *only* and uppercase for indicating stress/association with focus.

- (66) a. John only [gave any kale to HIS friends].  
 b. John only [gave KALE to any of his friends]. [Wagner 2005, ex. 25]
- (67) a. only [ HIS friends ] [  $\lambda x$ . John gave any kale to x ].  
 b. only [ KALE ] [  $\lambda x$ . John gave x to any of his friends]. [Wagner 2005, ex. 26]

When the focus to be associated with *only* is either on the VP-head, i.e., the verb, or enclosed within an island, then, for obvious reasons the whole constituent must move (and forms the restriction for *only*.) In these cases one would expect any NPI residing within the relevant constituent not to be licensed, although it is not associated with the focus of *only* itself. This prediction is borne out. Notice that this analysis does not carry over to negation, the reason for this may be that the negation operator does not associate with focus the way *only* does. Another option would be – if we were to assume also a tripartite structure for sentence negation, at least in connection (and maybe parasitic upon) narrow focus – that negation is DE on both of its arguments.

- (68) While John was willing to help cooking the vegetables, he was a bit particular about which chore he was going to be assigned.  
 a. \*John only [CUT any vegetables].  
 b. John didn't [CUT any vegetables]. [Wagner 2005, ex. 30]
- (69) only [ CUT any vegetables ] [  $\lambda x$ . John x ] [Wagner 2005, ex. 33]

Island sensitivity is not a surprise per se, since it is well-known that NPIS are subject to island constraints, as already noted in Ross (1967). Regarding association with focus, it

<sup>17</sup> There are some data, where *any* or *ever* are licensed in the restrictor of *only*, though. However, these involve covert universal quantification, and the NPIS are licensed in the restrictor of these universals, independently of the properties of *only*.

- i. Only (those) students who have ever been on any mountain higher than 5000m will participate at the expedition.
- ii. Nur (die) Studenten, die jemals auf auch nur irgendeinem Berg höher als 5000m waren, nehmen an der Expedition teil.
- iii. Nur wer jemals auf dem Kilimandscharo war, weiss wie schwer der Aufstieg wirklich ist. Only who ever on the Kilimandscharo was, knows how difficult the ascension really is.

was sometimes taken as an argument against analyses involving movement. But as we have seen, not always the element associated with focus moves, but sometimes a much larger constituent containing the focus, depending on the syntactic constraints at work. One good example to demonstrate this is a constellation where the NPI is located within a DP, and another constituent within the same DP is associated with focus. When the determiner of the DP is definite, moving the focussed constituent out of the DP would result in a specificity-island violation.

- (70) a. ?I only [saw offprints of any pictures of JOHN].  
 b. \*I only [saw those offprints of any pictures of JOHN].<sup>18</sup> [Wagner 2005, ex. 33]  
 b'. \*I only [saw those offprints of any pictures of JOHN].

The semantics of *only* can be expressed in formal terms as follows.

- (71) *only*' [<sub>Restr.</sub>  $\alpha$ ] [ $\lambda x. P(x)$ ] =  $\forall x. x \in \alpha^{ALT} \wedge x \neq \alpha : \neg P(x)$ , where  $P(\alpha)$  is presupposed, and  $\alpha^{ALT}$  consists of objects of the same type as  $\alpha$  and varies from  $\alpha$  only with respect to the constituent which is in focus.

Due to the negation, weak NPIS are licensed in this semantic configuration, if they do not end up in the restrictor, since in that case they will also be part of the positive presupposition. Strong NPIS have to be interpreted in an extreme way, so the presupposition itself invalidates what should be asserted with a strong NPI.

What is still missing is a formal explanation to the behavior of *auch nur*. We have investigated some scalar properties of the two focus sensitive operators, but did not make them explicit in formal terms, yet. I believe that the crucial point lies in the behavior of *auch* under negation with respect to scalar items. We have already recognised that *auch* sometimes favors a meta-linguistic interpretation of negation, a reading which is not of our interest here. Under the right circumstances, *auch* allows for a 'normal' reading, where negation scopes into the scope of *auch*. The existential presupposition, namely that the formula is true of all alternatives other than the item in focus, is kept valid. Now, consider the following paradigm, where *auch* is to be interpreted as syntactically scoping over the object (and not with inverted scope over the subject.) Adding *noch* makes lower numbers accessible as alternatives, since we get an ordering of situations where the numbers are bound by each individual situation and refer to distinct maximal quantities of dumplings already eaten.

<sup>18</sup> The reason why this example is ungrammatical is twofold. Either, as indicated in example the restriction (JOHN) violates the syntactic island constraint. Or, as indicated by (b'), if the restriction spans over the whole DP (*those offprints of...*), then the NPI is not licensed.



- (72) a. Peter hat auch<sub>1</sub> %(noch) FÜNF<sub>1</sub> Knödeln gegessen.  
       ‘Peter ate also FIVE dumplings.’
- b. Niemand hat auch<sub>1</sub> %(noch) FÜNF<sub>1</sub> Knödeln gegessen.  
       ??‘Nobody ate also FIVE dumplings.’

Due to pragmatic reasons, which I tried to explicate in the beginning of this section, it is the scalar item, in the case at hand the numeral, which is the only element that may trigger variation on the alternative set. Hence it must be in focus, and be associated with *auch* (and *nur*). Neither the property of being a dumpling, nor the predicate *eat* are sensible properties to vary the items in the alternative set upon. In (72b) it would also be impossible to associate the subject *niemand* with *auch*. What makes the sentence in (72b) without *noch* odd is the circumstance that the alternatives relevant for *auch* must be distinct from the item in focus. If it were only for smaller quantities than 5, a set of alternatives would be readily available, but these alternatives are simply entailed by the scalar item ‘5’, and therefore do not count. The sentence can only have the interpretation of different competitions, e.g., eating 3 dumplings of one sort, eating 4 of another sort, and finally eating 5 dumplings of yet another sort. This setting, however, is rather implausible. What is crucial here is that *auch* seems to be anti-exhaustive with respect to its alternatives. Even worse is a situation, where the numeral expresses some minimum, as is the case with our strong NPIS. This is so, because in such a case it is merely impossible to construe a setting with any available alternatives.<sup>19</sup>

- (73) a. \*Peter hat auch<sub>1</sub> (noch) einen EINZIGEN<sub>1</sub> Knödel gegessen / essen können.  
       \*‘Peter ate / was able to eat also a SINGLE dumpling.’
- c. ??Niemand hat auch<sub>1</sub> (noch) einen EINZIGEN<sub>1</sub> Knödel gegessen / essen können.  
       \*‘Nobody ate / was able to eat also a SINGLE dumpling.’

Notice that *auch* behaves more relaxed when we leave the scalar context. Still, a sentence with *auch* under negation improves when we enforce additivity with *noch*. The (b.) sentence is a paraphrase of (74a).

- (74) a. Ich habe nicht auch noch den PETER besucht.  
       %‘I didn’t visit also PETER.’
- b. Ich habe Peter nicht besucht, aber ich habe andere Leute besucht.  
       ‘I didn’t visit Peter, but I visited other people’

<sup>19</sup> The sentences with *noch* may have a marginal interpretation with *noch* interpreted as ‘yet another’. In that sense they would be acceptable, but this is not of our concern here.

The crucial point is that in (73) a scalar item is in focus. *Noch* on the other hand enforces a purely additive interpretation with an existential presupposition. Under negation only the asserted sentence, which contains the item in focus, is negative, the presupposition itself is shielded from negation and the entailment relations on the scale do not change. While we deal with a scalar item, the requirement must be fulfilled that the item in focus gives the strongest proposition with respect to the other elements on the scale. Clearly, entailment in non-DE contexts goes from bigger quantities to smaller ones and not vice versa. In (73a) ‘*einen einzigen Knödel*’ is already a minimum, so the existential presupposition is undefined and fails. In a DE context the existential presupposition runs into the same problem, since it itself does not contain the DE operator. One could apply a real scalar interpretation to *auch*, but this interpretation is disfavored in our context, and with the addition of *noch* it is even impossible. A formalization of the meaning of additive *auch* would look as follows:

- (75)  $\text{auch}_{\text{ADD}}' [\text{Restr. } \alpha ] [ \lambda x. P(x) ] = P(\alpha)$ , where  $\exists x . x \in \alpha^{\text{ALT}} \wedge x \neq \alpha : P(x)$ ;  $\alpha^{\text{ALT}}$  consists of objects of the same type as  $\alpha$ , and  $\alpha$  is maximally distinct from its alternatives:  $\forall x . x \in \alpha^{\text{ALT}} \wedge x \neq \alpha : x \cap \alpha = \{ \}$ .

Notice that in the scope of a DE operator, for both of the items under discussion, *nur* and *auch*, there is no scale reversal. *Nur* protects its scale with the implicit universal ranging over potentially scalarly ordered alternatives, and additive *auch* existentially presupposes the propositions with the alternatives. A scalar ordering is not part of the meaning of additive *auch*. In case the item in focus is scalar itself, one can infer the presupposition by the entailment relations established on that scale, but only from larger to smaller quantities.

#### 3.3.3.4 Putting things together

What happens if we combine *auch* with *nur*? Let us attempt to develop an analysis, which derives the meaning of *auch nur* from the meaning of *auch* and *nur* in a compositional way. What we have to account for are the following properties: *Auch nur* behaves like *even*<sub>NPI</sub> in English in that it is only appropriate in DE contexts. It differs from *even* in that it does not introduce a scalar meaning by itself, but it requires one. *Even* is unambiguously scalar, *auch* may acquire a scalar meaning, depending on the scalar properties of the item in focus. This can be illustrated by the following contrast.

- (76) a. Nobody didn't even visit PETER.  
 b. ??Niemand hat auch nur PETER getroffen.

Unless there is an explicit context, in which visiting Peter is the most unlikely thing to happen on earth, for whatever reason, the German sentence with *auch nur* is simply at

odds. In English, *even* introduces a likelihood scale operating on contextually given alternatives, and the sentence is fine. Visiting Peter is the least likely thing in this context, but likelihood is understood in a relative manner. For that reason it would be not correct that *auch nur* has just exactly the same meaning as *even* in DE contexts. Secondly, it has to be explained, why *auch nur* is sensitive to DE operators, whereas *even* as a lexical item is not. And third, it would be disappointing, if we had to propose a complex lexical item “*auch nur*”, when it is obvious that it is made up from two well known focus particles.

In a first step, I will try out a simplistic compositional analysis, which treats *auch* and *nur* as two independent operators in an asymmetric scope relation. Although there can be a marginal interpretation for certain sentences where this obtains, for the cases of interest it will turn out immediately that this analysis cannot be adequate, and we have to abandon the idea of independence. In a second step, we will propose an analysis, which treats the two operators as associating simultaneously to the same item in focus. This has as one consequence that the constituent formed by *nur* plus the item in focus must be taken to be presupposed relative to the assertion of *auch*. In turn, all other presuppositions normally associated with either of the two operators have to be re-generated. In a framework, which treats presuppositions of this sort as inferences based on logical or pragmatic principles, this is not really surprising, given the loss of independence of the two operators. I will present further empirical data and also show, why *auch nur* not only is sensitive to DE-operators, but also demands a scalar item in focus, and furthermore, why it displays a variable behavior with different kinds of scalar items, the most robust ones being minimizers or radically unspecific indefinites.

On the simplistic compositional account, which will prove not correct for our purposes, the construction of the alternative set relative to the item in focus depends on the lower operator, *nur*. In scalar contexts, it contains elements higher than the item in focus, in non-scalar ones there is no ordering and it contains all other available alternatives. The assertion of *nur* is that these alternatives all give false propositions when the propositional scheme, or background, is applied to them. Notice that the determination of alternatives to the scalar item is invariably bound to the meaning of *nur*, and we do not expect any scale reversal with respect to the alternatives under consideration. The presupposition coming with *nur*, which states that the proposition containing the item associated with the focus is true, must be kept intact.

*Auch* must take whole predicate containing the phrase with *nur* as its complement. The scalar item itself then does not constitute alternatives for *auch*, and we expect an additive interpretation. The assertion matches the presupposition of *nur*, and there is an existential presupposition regarding some alternative actions. An example for such a constellation would be the following, which in principle is ambiguous with respect to the

associate of *auch*: it could be the subject, or the VP, therefore I use indices to enforce the more interesting reading.

- (77) Ich werde dann auch<sub>1</sub> [nur<sub>2</sub> [eine Kleinigkeit]<sub>2</sub> essen]<sub>1</sub>.  
 ‘Then I will also eat only some small dish.’<sup>20</sup>

The sentence means that I will eat something, which is only a small dish. It takes for granted that there are some other activities I will do, such as taking a shower, or reading a book. Definitely, there is no eating other things involved, because this would contradict the assertion of *nur*.

The above sentence is fine, since it makes sense to associate the whole predicate with *auch*, leaving the item in focus for *nur*. In other contexts this is not possible, and we will see that these are ungrammatical regardless of polarity. When *auch* associates only with the phrase headed by *nur*. It is not hard to see that in positive contexts, we immediately get a contradiction. For a first test, let us use a non-scalar expression, and assume that the alternative set activated in the discourse consists of some three other friends (Susi, Bill, Carina). (79) are the simplified semantic representations, for reasons of simplicity I also leave out the maximal distinctness requirement for *auch*, since the set of alternatives contains distinct elements, anyway.

- (78) a. Ich habe nur<sub>1</sub> [den PETER]<sub>1</sub> besucht.  
 ‘I only visited PETER.’  
 b. Ich habe auch<sub>1</sub> [den PETER]<sub>1</sub> besucht.  
 ‘I visited PETER, too.’  
 c. \*Ich habe auch<sub>1</sub> [nur<sub>2</sub> [den PETER]<sub>2</sub> ]<sub>1</sub> besucht.  
 \*‘I only visited PETER, too.’
- (79) a. Assertion:  $\forall x . x \in \{P, S, B, C\} \wedge x \neq P : \neg (\text{Ich habe } x \text{ besucht})$   
 Presupposition: (Ich habe Peter besucht).  
 b. Assertion: (Ich habe Peter besucht)  
 Presupposition:  $\exists x, x \in \{P, S, B, C\} \wedge x \neq P : (\text{Ich habe } x \text{ besucht})$   
 c. Assertion: [*auch*:] (Ich habe Peter besucht)  $\wedge$   
 [*nur*:]  $\forall x . x \in \{P, S, B, C\} \wedge x \neq P : \neg (\text{Ich habe } x \text{ besucht})$   
 Presupposition: [*auch*:]  $\exists x, x \in \{P, S, B, C\} \wedge x \neq P : (\text{Ich habe } x \text{ besucht}) \wedge$   
 [*nur*:] (Ich habe Peter besucht)

<sup>20</sup> Many thanks to Micha Wille, who helped me a lot with *auch* and *nur*, endowing me with the needed amount of inspiration and motivation. While finishing this section, she just came up with this example on the phone, which made me understand the crucial difference.

In (79c) the assertion of *nur* and the existential presupposition associated with *auch* contradict each other. I have already mentioned that the presupposition of *nur* cannot arise in certain contexts, specifically scalar ones. However, in the treatment we have just proposed, the presupposition of *nur* matches the assertion. But it should be easy to amend the configuration by inserting negation. Then the assertion of *nur* states that not for all alternatives the propositions are false, and the existential presupposition could easily be fulfilled. This prediction is not borne out.

- (80) a. \*Ich habe nicht auch<sub>1</sub> nur<sub>1,2</sub> den PETER<sub>2</sub> besucht.  
 \*‘I didn’t only visit PETER, too.’
- b. Assertion: [auch:]  $\neg$  (Ich habe Peter besucht)  $\wedge$   
 [nur:]  $\neg \forall x . x \in \{P, S, B, C\} \wedge x \neq P : \neg$  (Ich habe x besucht)
- Presupposition: [auch:]  $\exists x, x \in \{P, S, B, C\} \wedge x \neq P : ($ Ich habe x besucht)  $\wedge$   
 [nur:] (Ich habe Peter besucht)

Now the assertion of *auch* contradicts the presupposition of *nur*, so there is no way to combine an additive with an exclusive particle, where both have independent meaning, but share the same set of alternatives. Moreover, while the sentence in (80a) is taken to be odd, it might be assigned a marginal meaning, but one that states that I in fact visited ‘nobody at all’, which is clearly not what the semantic representation in (80b) conveys, on the contrary. This meaning comes about when *auch* is interpreted as scalar, its marginality can be explained by the fact that the set of alternatives is not scalar by itself, hence it is normally impossible to get a scalar reading for *auch* in such a case.

When the item in focus is a scalar term, *auch* can acquire its scalar meaning. Crucially both focus operators associate with that item directly, and this is why we get the impression that *auch+nur* form a unit. This makes sense also in terms of a standard theory of focus, where it is assumed that focus operators may associate with constituents deeper embedded in the structure. Still, there is something special about this assumption. Recall the example from von Stechow (1991)/Rullmann (1997) where *even* had scope over *only* (“Bill even danced only with Sue.”), where it was crucial that the two focus operators do not share exactly the same associate, but demand for a compositional treatment in the strict sense.

If we are on the right track, then the overall assertion is only the assertion of the higher focus operator *auch*. What will be removed from the representation given for additive *auch* is the presupposition coming along with *nur*, because the inference is no longer valid in a scalar negative context. Notice that it would plainly contradict what is asserted. What changes as well is that the assertion of *nur* is not in the immediate scope of negation. This must be the case since negation only negates the assertion of the higher focus operator and associates to the scalar meaning. Then the assertion of *nur* behaves if it

were presupposed.<sup>21</sup> Again, we have to be careful with the term presupposition, but in the case at hand, what happens is that the assertion of *nur* is insensitive to negation. The presupposition of *auch* will be the same, it just states that there is a scale and that the item in focus marks the one element among its alternatives, which gives the strongest meaning.

Just to make clear, how the scalar meaning of *auch* works, consider again the example from Altmann (1976) / Krifka (1998) with pragmatic superlatives. Here we see that the scalar entailment works both ways, depending on the polarity of the sentence, which in turn determines, which element on the scale is the least likely, i.e., gives the strongest proposition.

- (81) a. Auch der SCHNELLSTE Computer kann diese Aufgabe nicht lösen.  
       ‘*Even the fastest computer cannot solve this task.*’
- b. Auch der LANGSAMSTE Computer kann diese Aufgabe lösen.  
       ‘*Even the slowest computer can solve this task.*’

The subject of these sentences may be treated as (aboutness-) topics, but for sure not as contrastive topics. Now consider the same with an exclusive particle, *nur*, where the meaning changes, but still we get the same scalar effect.

- (82) a. Nur der SCHNELLSTE Computer kann diese Aufgabe lösen.  
       ‘*Only the fastest computer can solve this task.*’
- b. ??Nur der LANGSAMSTE Computer kann diese Aufgabe nicht lösen.  
       ‘*Only the slowest computer cannot solve this task.*’

Interestingly, we perceive a contrast between the two sentences. While it is appropriate to state that the fastest computer is exclusive with respect to its capability to solve this task, it is quite odd to state the reverse for the slowest computer. Notice that both sentences try to comment on the difficulty of the task itself. If it is very hard to solve, it makes sense to express that no computer will be able to solve it, maybe with the exception of the fastest. In the reverse situation the task is so easy that every computer will be able to solve it. Imposing an exception would cast doubt on what is conveyed as the meaning of the assertion: maybe it is not so easy?

Another context where *nur* displays an asymmetry with respect to overall polarity, which is absent from scalar *auch*, are idiomatic NPIS denoting minimal or maximal quantities. They are fine with *auch*, but with *nur* they lose their idiomatic meaning.

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<sup>21</sup> What we have here is a constellation where negation immediately scopes over an item associating with narrow focus (*nicht ... auch ... PETER*). The notion of presupposition comes close to the terminology of early accounts for focus structures (Chomsky 1971, Jackendoff 1972), and makes sense in that way, to my intuition.

- (83) a. Niemand hat auch ?(nur) einen Finger gerührt, um zu helfen.  
       ‘*Nobody lifted a finger to help.*’  
       b. ??Peter hat nur einen Finger gerührt, um zu helfen.  
       ??‘*Peter only lifted a finger to help.*’
- (84) a. Auch zehn Pferde bringen mich nicht dort hin.  
       ‘*Even wild horses won’t get me there.*’  
       b. %Nur zehn Pferde bringen mich dort hin.  
       %‘*Only wild horses would get me there.*’

The (b.) examples differ from the (a.) examples with respect to polarity, but also whether they express a general negative statement, or one that asserts the endpoint as the one and only exception to an otherwise negative universal generalization. In order to be interpreted as an idiom, hence scalar with a universal characteristics, hence as an NPI, the item itself must be in the scope of a DE operator. Otherwise a literal meaning will obtain, which in case of ‘lift a finger’ is impossible, but when talking about numbers of horses as a limit, it is.

To finish our discussion, let us see what the meaning of *auch+nur* looks like, if *auch* is to be taken as a scalar focus marker. Take our dumpling-eating contest, and assume that it is large dumplings that are available as sports-accessories. Then 5 would constitute a reasonable number to distinguish between winners and losers. In that context, consider the following sentence, which surprisingly (in the light of what we have experienced before) is fully grammatical.

- (85) Niemand hat auch<sub>1</sub> [nur<sub>1</sub> [<sub>F</sub> FÜNF<sub>1</sub> Knödeln] ] gegessen.  
       ‘*Nobody ate even five dumplings.*’

*Nur* invariably considers alternatives higher on the scale than the item in focus. This is so, because *nur* is protected from polarity reversal, since every DE-operator would associate with scalar *auch*. Just as an observation, remember that also the connective *AND* proved as an intervener with respect to the immediate scope constraint of NPI licensing. The additive meaning of *auch* clearly can be directly compared with the meaning of *AND*, and I want to claim that scalar *auch* does not differ in that respect. *Auch* demands that the alternatives must be maximally distinct from the item in focus, and in its scalar use it must be defined in a way that it is sensitive to DE operators. This is not new, since scales of likelihood are always sensitive to DE-operators (cf. the discussion about *even*). Just to make sure, I do not want to claim, that *auch* would be ambiguous between the two meanings, a scalar and a plain additive one. On the contrary, I take the sensitivity to scalar items as focus associates as a good indicator that in fact there is just a contextually motivated strengthening involved. For *auch* in isolation, the alternative set defined by a scalar item itself (which, as

we have seen before, can even be a pragmatic superlative) can have a minimum or a maximum on either side. The scalar presupposition of *auch* only requires that the item in focus gives the strongest proposition. The universal character of the presupposition can be understood as a result of the entailment based on the scalar ordering. (The conditions on the alternative set are in brackets, since they may be derived from the definition of a scale.)

- (86)  $\text{auch}_{\text{SCAL}}' [\text{Restr. } \alpha ] [ \lambda x . P(x) ] = P(\alpha)$ , where the set of alternatives is ordered on a scale of likelihood with  $\alpha$  on the low end, marking the strongest element. Therefore,  $\forall x . x \in \alpha^{\text{ALT}} \wedge x > \alpha : P(x)$ ; ( $\alpha^{\text{ALT}}$  consists of objects of the same type as  $\alpha$ , and  $\alpha$  is maximally distinct from its alternatives:  $\forall x . x \in \alpha^{\text{ALT}} \wedge x \neq \alpha : x \cap \alpha = \{ \}$  ).

From that definition, it should be clear what happened to the existential presupposition: since universal quantification not necessarily presupposes existence, it cannot be inferred, and the clue is that in DE contexts, it would contradict what is asserted. (Plain universal quantifiers sometimes come along with such an existential presupposition. This, however, I take also to be a pragmatically motivated inference, which is absent here.) The definition of scalar *auch* and *nur* applied to our last example gives us the following representation:

- (87) b. Niemand hat auch<sub>1</sub> [nur<sub>1</sub> [F FÜNF<sub>1</sub> Knödeln] ] gegessen.  
 ‘Nobody ate even five dumplings.’
- b. Assertion:  $[\text{auch:}] \neg(\exists y: \lambda y(\text{y hat 5 Knödeln gegessen}))$   
 Presupposition:  $[\text{auch:}]$  there is a scale, with 5 at the low end:  
 $\forall n.n \in \mathbb{N} \wedge n > 5: \neg(\exists y: \lambda y(\text{y hat } n \text{ Knödeln gegessen})) \wedge$   
 $[\text{nur:}] \forall n.n \in \mathbb{N} \wedge n > 5: \neg(\exists y: \lambda y(\text{y hat } n \text{ Knödeln gegessen}))$   
 Scal.Implicature:  $\forall n.n \in \mathbb{N} \wedge n < 5: (\exists y: \lambda y(\text{y hat } n \text{ Knödeln gegessen}))$

The two universal statements making up the presupposition are now identical. There is also a scalar implicature in the sense of Chierchia, which expresses that the assertion does not hold for any stronger item on the scale, and since 5 is not an absolute minimum, it is also defined. This corresponds to the facts: in a strong interpretation the sentence also conveys that there are people that have made it up to lower numbers of dumplings. If we have a non-DE context, the scale being associated with *auch* is reversed, 5 gives the strongest statement with respect to smaller numbers.



- (88) b. Peter hat auch<sub>1</sub> [nur<sub>1</sub> [<sub>F</sub> FÜNF<sub>1</sub> Knödeln] ] gegessen.  
 ‘Peter ate even five dumplings.’
- b. Assertion: [auch:] (Peter hat 5 Knödeln gegessen)  
 Presupposition: [auch:] there is a scale, with 5 at the low end:  
 $\forall n . n \in N \wedge n < 5: (\text{Peter hat } n \text{ Knödeln gegessen}) \wedge$   
 $[nur:] \forall n . n \in N \wedge n > 5: \neg (\text{Peter hat } n \text{ Knödeln gegessen})$   
 Scal.Implicature:  $\forall n . n \in N \wedge n > 5: \neg (\text{Peter hat } n \text{ Knödeln gegessen})$

There is no contradiction involved. However, we do get a different set of alternatives: the complement excluding the item in focus. This, however, is impossible, because *auch* and *nur* associate with the same item in focus, and must therefore also share the same set of alternatives. This explains, why scalar *auch+nur* can only be found felicitously in the immediate scope of a DE operator. The reader might wonder why it took me such a great number of detours to come to this overall simple conclusion, but I found it worthwhile to clarify the surrounding effects first.

To sum up, in the following table we find the schematised semantic representations for all focus particles discussed so far.  $\alpha$  is meant to be the element in focus ‘P’ I take to be the formula representing the background of the relevant focus particle, hence including negation if it has immediate scope. ‘P<sub>abs</sub>’ is the propositional scheme devoid of negation (or a scale reversing operator) in the sense of presupposition projection (of existential presuppositions).

(89)	assertion	presupposition	
<i>auch</i> <sub>ADD</sub>	P( $\alpha$ )	$\exists x: P_{\text{abs}}(x)$	additive
<i>noch</i>	P( $\alpha$ )	$\exists x . \alpha > x: P_{\text{abs}}(x)$	additive
<i>auch</i> <sub>SCAL</sub>	P( $\alpha$ )	$\forall x . \alpha <_{\text{likely}} x: P(x)$	scalar
<i>nur</i>	$\forall x: \neg P(x)$	P <sub>abs</sub> ( $\alpha$ )	exclusive
<i>auch nur</i>	P( $\alpha$ )	$\forall x . \alpha <_{\text{likely}} x \wedge \alpha < x: P(x)$	scalar + DE
<i>sogar</i>	P( $\alpha$ )	$\exists x . \alpha <_{\text{likely}} x: P(x) \wedge P_{\text{abs}}(x)$	scalar + non-DE

Let us repeat the description given by Horn & Lee for *even* in English, which for convenience I repeat below. Their semantic definition is apt to characterize both, *even* in DE contexts and in non-DE contexts. The intuition behind is that the item in focus must give the strongest proposition, and we have also seen elsewhere that this corresponds to, or can even be derived by general pragmatic principles. The difference to the German paradigm is that *sogar* comes with an existential presupposition, making it inapt to occur in DE contexts, while *auch nur*, due to the encapsulated assertion of *nur*, which behaves like

a scalar presupposition in that it does not display sensitivity to negation, is bound to occur in DE contexts.

- (90) even ( $\alpha, P$ ) [where  $\alpha$  is the focus of *even* and  $P$  is the proposition schema obtained by abstracting over the focus]

Assertion:  $P(\alpha)$

Presupposition: There is a likelihood scale with  $\alpha$  at the low end for which  $P$  holds, and a linear order  $>$  defined as follows:  $x_2 > x_1$  iff  $P(x_2)$  is more likely to hold than  $P(x_1)$ . [ $\forall x_i: P(x_i) > P(\alpha)$ ]

Implicature:  $\forall y (y > \alpha): P(y)$

When scalarity and association with focus is expressed by a single syntactic unit, we spare many problems and side-effects that appear with *auch* and *nur*, but basically their meaning properties coincide, pace the fact that the scalar interpretation in part depends on the scalar nature of the item in focus. To conclude let me just present some data in connection with conditionals. All the above mentioned focus particles are fine in conditionals, but they trigger diverging pragmatic effects.

- (91) a. Wenn Peter auch<sub>1</sub> (noch<sub>1</sub>) [FÜNF<sub>1</sub> Knödeln] schafft, dann hat er fast schon gewonnen.<sup>22</sup>  
 ‘If Peter manages to eat also 5 dumplings, he almost has already won.’
- b. Wenn Peter nur<sub>1</sub> [FÜNF Knödeln]<sub>1</sub> schafft, dann wird er nicht gewinnen.  
 ‘If Peter manages to eat only 5 dumplings, he won’t win.’
- c. Wenn Peter sogar<sub>1</sub> [FÜNF Knödeln]<sub>1</sub> schafft, dann ist er nicht zu überbieten.  
 ‘If Peter manages to eat even 5 dumplings, he can’t be beaten.’
- d. Wenn Peter auch<sub>1</sub> nur<sub>1</sub> [FÜNF Knödeln]<sub>1</sub> schafft, hat er gute Chancen.  
 ‘If Peter manages to eat even 5 dumplings, he has good chances.’

Peculiarly interesting is (91d) where we have polarity sensitive *auch nur*. We know that antecedents of conditionals are (potentially) DE, so it is not surprising that the structure is grammatical. However, it doesn’t state that Peter won’t manage to eat 5 or more than 5 dumplings, rather that it is not necessary for him to eat more than 5 in order to have good

<sup>22</sup> There is also a reading, where *auch* does not have direct scope over the numeral, but has sentential scope (above the conditional). The interpretation of *wenn ... auch* (= *auch wenn*, see example 92) is similar to the one discussed here: the English translation would be *even if*.

- i. Wenn du auch nur irgendein Papier über NPIS liest, wirst du das Problem erkennen.  
 ?‘If you read even just any paper about NPIS, you will notice the problem.’
- ii. Auch wenn du nur irgendein Papier über NPIS liest, wirst du das Problem erkennen.  
 ‘Even if you read just any paper about NPIS, you will notice the problem.’

chances to win the competition. It is important to notice that with the scalar meaning, not only *auch*, but also *nur* is disentagled from negation. The focus within the antecedent refers to a minimum quantity where the conditional can be fulfilled. The difference to the preceding example (91c) with *sogar* is that in the latter case we are forced to assume that alternatives are defined as if the antecedent were not DE, at least with respect to the alternatives, which get a factive interpretation. In turn the threshold of the expectation that Peter wins is set lower. *Sogar* indicates that the item in focus is beyond that threshold, and the factual conditional holds, whereas in (91d) the threshold for winning is taken to be higher than the indicated quantity, and we can only express that “Peter has good chances”. The meaning of additive *auch* (91a) on the other hand is satisfied, if there are existentially presupposed alternatives. It does not make such a strong claim as (91c) due to the absence of scalar inference, hence no threshold of expectations is introduced. In (91b) with *nur* the quantity of dumplings under discussion is confined by the numeral. In that case it does not make sense to state anything about Peter’s chances to win, but rather that he might not win, if he only reaches the expressed confinement.

As is well known, all these focus markers, with the exception of *auch nur*, can be used to associate directly with the conditional. The reasons why *auch nur* is not possible is obvious: it would fail to reside in a DE environment. As one could expect, scalar relations are reverse, as the (higher) focus particle now operates on the alternatives themselves, rather than scalar expressions within the alternatives. Crucially, the sentences without secondary focus markers are ambiguous between an UE and a DE interpretation with respect to the scalar items. Given that we can infer a threshold quantity for the chances of Peter to win the competition, and also assuming that that threshold must be higher than some minimum, at least greater than one, we can now trace the relevant interpretations.

- (92) a. Auch<sub>1</sub> [wenn Peter sogar<sub>2</sub> [FÜNF Knödeln]<sub>2</sub> schafft]<sub>1</sub>, dann wird er nicht gewinnen.  
 ‘Also if Peter (even) manages to eat 5 dumplings, he won’t win.’
- b. Auch<sub>1</sub> [wenn Peter (nur/\*auch nur)<sub>2</sub> [FÜNF Knödeln]<sub>2</sub> schafft]<sub>1</sub>, dann kann er gewinnen.  
 ‘Also if Peter (only) manages to eat 5 dumplings, he can win.’

As in (92a), lower *sogar* marks that an inferred threshold of likelihood has been surpassed, higher *auch* on the other hand states that the same is true for the expressed antecedent, and for (scalar) alternatives of the antecedent. Hence we can infer that what is expressed by the antecedent is of no use for Peter to win the competition, since the lowest alternative results in not having any chance to win. Scalar *nur* in (92b) projects a reversed scale. *Auch* induces the inference that whatever the conditional expresses will be true in the same way as it will be true for higher alternatives, hence there are good chances to win. By the same

reasoning the following examples with *nur* taking scope over the conditional display not reversed scalar effects, *nur* combines with the scale reversing property of conditionals and does not change the scalar environment within the antecedent. *Only if* clauses are just a special case of regular conditionals in that they impose an exhaustive interpretation.

- (93) a. Nur<sub>1</sub> [wenn Peter (auch/sogar)<sub>2</sub> [FÜNF Knödeln]<sub>2</sub> schafft]<sub>1</sub>, dann kann er gewinnen.  
 ‘Only if Peter manages to eat only 5 dumplings, he may win.’
- b. Nur<sub>1</sub> [wenn Peter nur<sub>2</sub> [FÜNF Knödeln]<sub>2</sub> schafft]<sub>1</sub>, dann kann es sein, dass er verliert.  
 ‘Only if Peter manages to eat only 5 dumplings, it can be the case that he loses.’

Not surprisingly, the interpretations with *sogar*, are the same as for *auch*. The only difference (but maybe an interesting one) that it favors a modal consequent. This may be due to the built-in scalar nature of *sogar/even*, which is absent from additive *auch*. Expressing a scalar relation is in some sense weaker than expressing an explicit exhaustive relation among alternatives. But for the same reason we may find scalar *auch nur* in the antecedent, which is clearly not possible with *auch* scoping over the conditional.

- (94) a. Sogar<sub>1</sub> [wenn Peter auch<sub>2</sub> [FÜNF Knödeln]<sub>2</sub> schafft]<sub>1</sub>, kann es sein dass er verliert.  
 ‘Even if Peter manages to eat also/even 5 dumplings, it may be the case that he loses.’
- b. Sogar<sub>1</sub> [wenn Peter (nur/?auch nur)<sub>2</sub> [FÜNF Knödeln]<sub>2</sub> schafft]<sub>1</sub>, hat er gute Chancen.  
 ‘Even If Peter manages to eat only 5 dumplings, he has good chances.’

In this section we have outlined an analysis of focus particles in German with respect to their scalar properties, presuppositions and their relation to downward entailingness. Of special interest was the complex of *auch* plus *nur*, which corresponds to *even* in English in DE environments. Applying Occam’s Razor again, we suggested that neither the complex itself has an independent meaning, nor are the parts of it treated as if they were affected by some special meaning component only arising in that particular combination. Hopefully successfully I tried to show that all in all it is possible to derive the specific meaning properties from the basic meaning of its components. What had to be taken into consideration is that the two operators do not create their independent focus domains, but rather associate with the very same element in focus. This has several effects: the scalar assertion of the lower particle *nur* is shielded from higher DE operators, which can be seen as a particular instance of an intervention effect. Therefore its assertion component

behaves in a presupposition like manner, and no scale reversal may apply upon the scalar ordered alternatives. The existential presupposition of *nur*, which is better viewed as a pragmatically motivated inference, may not show up in purely scalar contexts, an effect that has been reported for *even* by Rullmann (1997). The higher element, *auch*, which comes as a purely additive or as a scalar operator is confined to a scalar interpretation, otherwise the arising existential presupposition of *nur* contradicts the overall assertion in DE contexts, or the assertion of *nur* contradicts the existential presupposition of *auch*. In its scalar use, it has to match the alternative set determined by *nur*, since they associate with the same item. This alternative set, however, is fixed, due to the shift of the scalar component of *nur* into a presupposition. Scalar *auch* on the other hand demands that the item in focus be the least likely, viz. give the strongest proposition with respect to alternatives. In order to fulfill all these requirements, the whole complex must invariably be in the immediate scope domain of a DE (scale reversing) operator.

In the following subsection I want to discuss what happens when *auch+nur* combines with various indefinite noun phrases. As expected, we get different sorts of NPis, but what is interesting is that they do not have exactly the same properties.

### 3.4. A note on strength

In the previous section we have seen that scalar (additive) focus particles in DE contexts create universal inferences among the whole set of alternatives associated with the focus of the expression under discussion. As for the German case (*auch nur*) the scalar nature of the item in focus was taken as a prerequisite to that particular interpretation. While we have played around with scales upon numeral quantities, we have also noticed that when conventionally used (idioms, measures) or explicitly expressed ('a single') minimizers are taken, the meaning expressed is one of a general refutation of the existence of a referent that would satisfy the propositional scheme abstracted over negation. This coincides with the observation originally due to Zwarts (1990/93, 1998) that so-called strong NPis call for an anti-additive licenser, hence involving negation in one way or the other. This formulation was criticized by Krifka (1995) on both conceptual and empirical grounds, in that it does not really explain the described behavior and that certain licensing environments, which do involve negation and license strong NPis, fail to conform to the criteria put forth for anti-additivity.

Krifka's intuitive amendment was that since strong NPis can be taken to correspond to 'extreme' values in scalar domains, the relevant licensers must be 'extreme' in the same way. He correlates that with his notion of 'emphatic assertion', which involves non-exhaustivity on the side of the NPI, and which he takes to remain constant for the whole domain within which the NPI projects and must get licensed. (Just a small note on the notion of licensing. In the light of what we have discussed so far, it can no longer be a

deus-ex-machina device that states whether certain grammatical objects are licit in a given context. Rather the behavior of NPIS must be regarded as the compositional treatment of interacting semantic components, particularly referring to alternatives, that determine whether a given semantic representation can be taken to be defined or not. But maybe the difference is as subtle as the difference between doing all right and avoiding a catastrophe.) I take Krifka's intuition as being on the right track and want to just add a few thoughts regarding the 'extreme' nature of strong NPIS in contrast to weak NPIS.

In what follows, I might repeat myself upon what I stated in the first section of this chapter, but it will be relevant for the following discussion. Consider the following paradigm. When we use the standard strong NPIS with 'a single' together with the non-anti-additive, but nevertheless bona fide downward entailing expression 'fewer than 3', the result is odd. Using a plain indefinite instead, while keeping our focus particle complex *auch nur*, gives irritating judgments, while using the focus particle with the indeterminate *irgendein*, a constellation which I claim to directly corresponds to *any* in (almost) all of its uses in English, produces perfect results.

- (95) a. ??Weniger als 3 Studenten haben auch nur ein einziges Buch gelesen.  
       ??'Fewer than 3 students read even a single book.'
- b. ?Weniger als 3 Studenten haben auch nur ein Buch gelesen.  
       ??'Fewer than 3 students read even one book.'<sup>23</sup>
- c. Weniger als 3 Studenten haben auch nur irgendein Buch gelesen.  
       'Fewer than 3 students read any book.'

What seems to be at odds is that when we have a numeral quantifier expressing a minimal quantity not even making it to the assertion of a positive statement, we are not allowed to tolerate any existential presupposition or inference. Weak negative quantifiers, however, allow for this kind of inference, although they may not enforce it. The problem is not the scalar implicature we get if we apply Chierchia's algorithm for indirect scalar implicatures.

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<sup>23</sup> What seems to be irritating in this particular example is that the indefinite article in German is isomorph to the numeral 'one', which unambiguously shows up in the English translation. However, there seems to be a tendency that it must be focused anyway, hence the interpretation as a numeral pertains. To my intuition, these sentences improve when the item in focus is modified. The reason may be that when modified it is possible to construe an arbitrary set of alternatives, with a scalar ordering, though, while when there is only a bare noun, focus must go on the determiner, which in turn must get an interpretation as a numeral quantifier.

- i. Weniger als 3 Studenten haben auch nur eines von den empfohlenen Büchern gelesen.  
       'Fewer than 3 students read even one of the recommended books.'
- ii. Weniger als 3 Studenten haben auch nur ein relevantes Buch gelesen.  
       'Fewer than 3 students read even one relevant book.'

- (96) Fewer than 3 students read 5 books.  
 ⇒ Not fewer than 3 students read 4 books. ( $\approx$  Some students read 4 books.)

In case of a minimal quantifier in focus, this kind of indirect implicature would be undefined, due to the lack of stronger alternatives in DE contexts. However, the weak negative quantifier itself produces a direct implicature, since it is not extreme on a 'negative scale', and this one gives us the obnoxious existential side-kick, not compatible with the meaning of the strong NPI.

- (97) Fewer than 3 students read 5 books.  
 ⇒ Not no student read 5 books. (Some students read 5 books.)

Replacing '5 books' with 'even a single book' is the constellation we wanted to rule out. For completeness I repeat the 'licensing condition' for strong NPIS, amended with a reference to undefinedness as the culprit for failed licensing.

- (98) Licensing of strong NPIS: (final version)  
 A strong NPI must be in the scope of a DE operator, and there must not exist any (existential) implicature where it is not in the scope of a DE operator within the quantificational domain of that operator.

Corollary:

Otherwise, the focus meaning is undefined.

Chierchia is aware of the fact that *few* licenses weak NPIS like *any*. He assumes that the reason why *any* is still licensed in these cases is that direct implicatures are factored in only after the plain meaning is computed. For *any*-type NPIS he assumes that checking their widening/strength properties applies to the plain meaning, where it has to be in a DE environment in order to fulfill its strengthening requirements. Direct implicatures do not disturb the licensing of *any*. I take this to be correct, but the question then is, why do they apply to strong NPIS. The solution must be to forget about the procedural metaphor Chierchia uses (checking before generation of strong meanings), and ask when the strong meanings might be relevant. I agree with Chierchia's analysis for *any* to the extent that a proposition with *any* must be stronger than any alternatives, and that the evaluation of this requirement indeed applies to the plain meaning. If that evaluation failed, the meaning of the proposition would be undefined. Strong NPIS on the other hand involve focus, and alternatives defined in scalar terms. These alternatives are accessible in any step of evaluation, and the requirement is that they give the same truth value as the item in focus. So we are forced to evaluate also the strong meaning against the plain meaning, and any existential commitment within there results in a contradiction. This I take to be the reason why strong NPIS are confined to extreme/minimal licensors.

In the first section of this chapter we have investigated what happens if weak negative quantifiers like *few*, *at most*, or *fewer than n* are in the scope of negation or DE elements themselves. We found out that they cease to have their licensing capacities. One way out would be to analyze *NEG ... few* as *many*. Chierchia observes that *many* can display intervention effects as well, but only if an existential inference in the form of an indirect implicature is contextually motivated.

- (99) I typically don't have many students with any background in linguistics.  
[Chierchia 2001, ex. 135]
- (100) Typically in that course you do get some students that are interested.  
?? But don't expect that many students will show any interest.  
[Chierchia 2001, ex. 136]

This anti-compositional treatment would be fine with the core cases where negation is part of the sentence where *few* fails to license even weak NPis. But it starts to be problematic if *few* is in the scope of a negative quantifier as a time adverbial, still, one could treat negation as associating with *few* to give *many*, but then at least the time adverbial, which in the example at hand is a topic has to be reshaped as a universal quantifier, and not as an existential.

- (101) ??Never did few students read any literature in this class. =?  
\*Always many students read any literature.

I take this to be an inference in the form of a logical entailment, and not the reason why the NPI is blocked. Further complications involve negative predicates, like the adversative *doubt*. Although it can be argued that *doubt* kind of means *not believe*, this should not be taken as a semantic decomposition device, which in turn composes *not few* into *many*. This would be awkward, and unnecessary, since everything regarding the licensing capacities of NPis falls out under the premises we have made so far. Chierchia (2001) also strongly argues against such a treatment, although in a different context. Could it be indirect implicatures, which make licensing fail. Definitely they do, although they are quite hard to compute. Take for example a case with a numeral as the target scalar item.

- (102) I doubt that few students read 5 papers.

The direct implicature of 5, as well as the direct one of *few* are removed during the calculation process. The indirect implicature of *few* (not few students read 4 papers) is not of our concern with NPis, since it is undefined there. Chierchia does not discuss such a constellation, but I assume that it has to be removed as well, assuming that not the whole embedded sentence gets 'frozen' with respect to implicatures, in which case we also would



not expect to get any trouble with polarity licensing. I take this term from Chierchia (2004) where he discusses examples where a scalar item like *many* is embedded in the antecedent of a conditional, which is a canonical DE-environment. As expected, the direct implicature of *many* ('but not all') disappears, and an indirect one comes about. Hence (103a) has not the strong meaning as paraphrased in (103b) but rather as in (103c).

- (103) a. If it is true that many complained, we are in trouble.  
 b. If it is true that many but not all students complained, we are in trouble.  
 c. If it is true that many students complained, we are in trouble, but if few students complained, we are ok. [Chierchia 2004, ex. 23,24]

In different contexts, the direct implicature of *many* seems to get 'stuck'.

- (104) a. If it is true that many complained, it is also true that some didn't.  
 b. If it is true that many but not all students complained, it is also true that some didn't. [Chierchia 2004, ex. 25,26]

Diverging from his original proposal, he proposes an operator, which stops further computation of implicatures. See Chierchia (2004) for effects that he calls 'implicature freezing', and which coincide with restrictions on the licensing domains of NPIS. It is Chierchia himself, who re-introduces an operator (which he calls the  $\sigma$ -operator)<sup>24</sup> in order to define the domain of NPI licensing. In doing so, the similarities between NPI licensing and the ordinary calculus of scalar implicatures become significantly stronger, again. Something similar seems to go on with factive adversative predicates. Although there clearly is a reading where implicatures are computed up to the root of the assertion, there is also a reading where the embedded sentences 'freezes', and what I regret is the "fact that ..." and no scalar implicatures arise in the matrix sentence. *Any* can also be licensed, then.

- (105) a. I regret that few students read 5 papers.  
 b. I regret that few students read any paper.

After this small excursus, let us see what the implicatures are when they are all computed. To make things easier, let us start with a version where *doubt ... few* is exchanged for *believe ... many*. Since both *many* and *believe* are upward entailing expressions, we can

<sup>24</sup> Chierchia uses a definite description on its first occurrence, perhaps in order to infer familiarity. "The  $\sigma$ -operator comes to mind in this connection. We know, on independent grounds, that  $\sigma$  can be freely attached to a variety of clausal nodes (i.e. in the Spec position of heads that eventually give rise to expressions of type *t*). NPIS must be checked by  $\sigma$  (i.e., if you prefer, enter an agreement relation with a head  $\sigma$  can attach to.) [Chierchia 2004: 13] Though not referenced to by Chierchia, I feel a strong familiarity to Krifka's illocutionary operators, though.

attach negation to either of them without change in meaning (due to the possibility of neg-raising, cf. Horn 1978). A bit more tricky is the question where negation may attach in the context of the first direct implicature. Although it should apply to the predicate containing the numeral ('read *n* papers') I get the feeling that this is not the right way to derive the implicature, and that an interpretation where the subject *many students* is already within the scope of negation is the correct one. One of the problems is that the propositional scheme has to be applied to the alternatives in order to see whether the implicature is correct.

- (106) I believe that many students read 5 papers.  
 ⇒ (I believe that many students) didn't read 6 papers. ≈?  
 (I believe that) not many students read 6 papers.  
 ⇒ I believe that not every student read 5 papers. ≈  
 I don't believe that every student read 5 papers.

The situation becomes more complex if we replace *believe* with *doubt*. Just assume that all the direct implicatures valid above are removed by the DE adversative predicate. Then we only get the following

- (107) I doubt that many students read 5 papers.  
 ⇒ I don't doubt that some students read 5 papers.

With the original sentence, computation is much harder to imagine how it is to be done correctly. If *few* is on a negative scale, with *no* as the stronger element on that scale, then it is already hard to imagine what the next stronger element would be in a reversed context. It cannot be something like *more than few* as can be seen in (108d), which is in a logical entailment relation to the assertion of the sentence, but does not contribute to a stronger meaning.

- (108) I doubt that few students read 5 papers.  
 a.  $\text{dir}(5) \Rightarrow 5$  papers, but not 6. (removed by *few*)  
 b.  $\text{indir}(\textit{few}) \Rightarrow$  not few students read 4 papers (removed by *doubt*?)  
 c.  $\text{dir}(\textit{few}) \Rightarrow$  not no student read 5 papers (removed by *doubt*)  
 d.  $\#\text{indir}(\textit{doubt}) \Rightarrow$  I don't doubt that more than few students read 5 papers.  
 e.  $\text{indir}(\textit{doubt}) \Rightarrow$  I don't doubt that some student read 5 papers.

The actual (and only) implicature that this sentence has is the one in (108e), and it is astonishing that it is just the same as in (107) with *many*. The way out, I suspect, is to assume that *few* shifts onto a positive scale when it itself is in a DE context, just expressing

some small quantity. Then with respect to DE-ness the next stronger element is *some*.<sup>25</sup> The setup the relevant quantifiers is indicated below.

(109)	UE context		DE context
	some ← many ← every		some → many → every
	few ← none		some → few

The explanation why *few* blocks NPI licensing when it itself is embedded under a higher DE-operator is then that it is no longer a DE-quantifier, but blocks licensing from outside due to intervention effects.

We have seen that only negative quantifiers and negation itself are resisting higher scale-reversing operators. Other DE licensors such as *few* fail to license strong NPIS on their own existential (direct) implicature and fail to license all NPIS when they reside in DE contexts themselves. The same line of reasoning applies to other non-anti-additive DE expressions such as ‘*at most n*’ or ‘*fewer than n*’, all of which can act as interveners and lose their own DE property under higher DE operators.

Why do we always get weak NPIS in the restrictor of universal quantifiers, and in the antecedent of conditionals, but only sometimes strong NPIS? I have put forth the idea that it might have to do with the fact that strong NPIS are excluded if there are existential implicatures, such as a set of actual referents for a universal quantifier activated in or inferable from the discourse, or if the conditional can be inferred to be true. On a broader perspective, one could argue that this has to do also with the locality of NPI licensing. If there are specific referents to a universal quantifier, then a restrictive relative clause cannot project its alternatives up to the universal (and have access to the DE-property of universal quantification.) Or put in different words, the restrictor per se loses its monotonicity, since it has to be evaluated directly with respect to the discourse. Something similar obtains with conditionals, the evaluation domain for the alternatives projected by the scalar, strong NPI is closed off at the antecedent clause already. I think that it is this implicit ban on ‘factuality’, which has led Linebarger (1987) to propose a licensing constraint for exactly those contexts in terms of negative implicatures. Using non-idiomatic strong NPIS, we can now prove that her claim is simply not correct.

- (110) Jeder Student, der auch nur ein einziges Paper präsentiert hat, bekommt ein Zeugnis.  
 ‘*Every student who has presented even a single paper will get a grade.*’

<sup>25</sup> Chierchia, while discussing complex computations of the form [*few ... and ... numeral*], makes a similar comment: “*In particular, in no way not few here must be taken to suggest many (and that’s why the paraphrase in parenthesis with some it’s a better rendering of the implicature).*” [Chierchia 2001: 25]

Now we can make use of the  $\sigma$ -operator proposed in Chierchia (2004). Exactly when licensing fails, the  $\sigma$ -operator is lower than a potential licenser. It is worthwhile to note that Chierchia is very careful to distinguish this operator from the focus operator (expressed as  $\sim$ ), such as assumed in Rooth (1985, 1992) in order to confine the domain which is applied to the item in focus and its alternatives. (Recall Krifka's (1995) illocutionary operators which also introduced triples of a background, a focus value and a set of alternatives, but not necessarily coinciding with actual focus in a given sentence.) There are similarities though, obviously both operators work the same way, and often they do coincide. One difference is that focus alternatives are associated with stress, while scalar alternatives not necessarily have to be (they can, in order to emphasise (or invoke) exhaustiveness). Scalar alternatives are prompted by scalar lexical items (but sometimes also by focus particles such as *even* or, in the case of German NPIS *auch nur*). Secondly, "*scalar implicatures [...] appear to be more narrowly characterizable in terms of simple Gricean reasoning.*" [Chierchia 2004: 11] And finally, while focus alternatives tend to be taken to be actively present in the discourse, the alternatives associated with certain NPIS, specifically with unstressed weak NPIS like *any* have a modal flavor of some potential, which, however, must obey pragmatically motivated conditions on strength.

Chierchia directly assesses Dayal's notion of domain-vagueness and asks why there should be such a condition in addition to the modal and universal characteristics of *any*. He proposes a slightly modified perspective on domain widening and draws upon insights formulated in Kratzer & Shimoyama (2002) about *irgendein* in German, as well as Krifka's (1995) initiative contribution to a view that it is pragmatically motivated principle that guide the use of such an item as *any*. Chierchia's basic formulation comes down to the reasoning that when a speaker utters a certain sentence, he has good reasons not to use an alternative sentence, alternatives drawn from a set of alternatives coming with the item itself. The reasons could be that either the alternative statement would be weaker, hence the speaker obeys informativeness, or the speaker is not in the condition of saying that alternative statement, because he is not convinced that this couldn't result in a false claim. Free-choice would be such a case: free-choice *any* refers to the broadest domain, any more specific interpretation of the noun phrase could be such that it results in a false statement, while some other choice of alternatives may give a true proposition.

In this chapter I have tried to draw upon several proposals that deal with domain widening, alternatives, scalar implicatures and scalar properties within sets of alternatives. The focus of our attention were strong NPIS, for which a tight relation to association with focus was argued for several times in the literature. One goal, although it does not contribute directly to the overall picture, was to assess the meaning properties of the complex focus particle *auch nur* in German, which is the relevant one in the given context. The aim was to derive its meaning properties from the meaning properties of its parts,

without any further stipulation. I think that this aim could be fulfilled. Building upon the scalar nature of the item associated with focus, we could also deduce a sensible distinction between weak and strong NPIS with respect to their licensing requirements. Strong NPIS have an active set of scalar alternatives, so any implicature which results in an existential statement contradicts what is presupposed by the focus marker in connection with the NPIS. Hence, only extreme licensors, such as negation or negative quantifiers are apt to do their job properly. All in all, these NPIS convey a negative meaning (by entailment upon all activated alternatives), so this might be one reason, why these items are also often used to enforce, or even to express negation.

The relation between focus alternatives, scalar alternatives and the projection of alternatives in general has to be investigated in much greater detail in the future. Recall that Chierchia (2004) hesitantly proposes an operator of its own kind ( $\sigma$ ), and Krifka (1995) gives precise definitions for each of his illocutionary operators, while stressing the similarities and differences to focus structure at the same time. Only Beck (2006) in a very recent paper tries to develop on a more unified picture, based on certain common properties in connection with intervention effects, and she convincingly argues for a deeper parallelism between the components mentioned, also including the *wh*-operator. Still she concedes that there seem to be some selectional peculiarities, as to which operators count as interveners binding projecting variables, and blocking relations of a various sorts. I am convinced that future investigations will yield an even more coherent picture. One step has already been achieved: it seems to be clear now, that in order to understand certain properties of natural language, such as for example NPIS, one cannot rely on a theory that only refers to one of the components of grammar in isolation, be it syntax, semantics or pragmatics. On the contrary, certain objects, which have to be taken to belong to one of these components, have to be imported into the other components as well. Chierchia (2001) has initiated an important progress, while proposing that scalar implicatures are not an effect of an encapsulated, external pragmatic component, but rather must be treated in a compositional way within an extended semantic component. Matters become even more intricate, when we come to discuss what should be imported or reflected within syntax, but I will refrain from speculating here any further. There are alternatives, and maybe this is what makes life intricate, but interesting.



## Bibliography

- Abels, Klaus (2003) "Who Gives a Damn about Minimizers in Questions," In: *Proceedings of Semantics and Linguistics Theory 13*.
- Abney, Steven P. (1987) *The English noun phrase in its sentential aspect*. Ph.D. dissertation, MIT, Cambridge, Massachusetts.
- Abraham, Werner (1980) "The synchronic and diachronic semantics of German temporal *noch* and *schon*, with aspects of english *still*, *yet*, and *already*," *Studies in Language 4*, pp. 3–24.
- Abusch, Dorit (1994) "The scope of indefinites," *Natural Language Semantics 2*, pp. 83–135.
- Altmann, Hans (1976) *Die Gradpartikeln im Deutschen*. Tübingen, Niemeyer.
- Aoun, Joseph (1986) *Generalized Binding*. Foris, Dordrecht.
- Atlas, Jay (1996) "'Only' noun phrases, pseudo-negative generalized quantifiers, negative polarity items, and monotonicity," *Journal of Semantics 13*, pp. 265–328.
- Auwers, Johan van der (1993) "'Already' and 'Still': Beyond Duality," *Linguistics and Philosophy 16/6*, pp. 613–653.
- Bach, E. (1971) "Questions," *Linguistic Inquiry 2*, pp. 153–166.
- Baker, Carl Leroy (1970a) "A Note on Scope of Quantifiers and Negation," *Linguistic Inquiry 1/1*, pp. 136–138.
- Baker, Carl Leroy (1970b) "Double Negatives," *Linguistic Inquiry 1/2*, pp. 169–187.
- Baker, Carl Leroy (1970c) "Problems of Polarity in Counterfactuals," in: Sadock & Vanek (eds.), *Studies Presented to Robert B. Lees by his Students*. Edmonton.
- Baker, Carl Leroy (1970d) "Notes on the Description of English Questions: The Role of an Abstract Question Morpheme," *Foundations of Language 6*, pp. 197–219.
- Bartsch, Renate & Theo Vennemann (1973) *Semantic structures: A study in the relation between syntax and semantics*. Atheneum Verlag, Frankfurt.
- Barwise, Jon & Robin Cooper (1981) "Generalized quantifiers and natural language," *Linguistics and Philosophy 4*, pp. 159–219.
- Bayer, Josef (1990) "What Bavarian Negative Concord Reveals about the Syntactic Structure of German," in: J. Mascaro & M. Nespor (eds.) *Grammar in Progress*. Foris, Dordrecht, pp. 13–24.
- Bayer, Josef (1996) *Directionality and Logical Form: On the scope of focusing particles and wh-in situ*. Kluwer, Dordrecht.
- Beaver, David (1996) "Presupposition," in: Johan van Benthem & Alice ter Meulen (eds.) *Handbook of Logic and Language*. Elsevier, Amsterdam, pp. 939–1008.
- Beaver, David & Brady Clark (2002) *Always and Only: Why not all focus-sensitive operators are alike*. Ms., Stanford University.
- Beck, Sigrid (1996a) *Wh-constructions and Transparent Logical Form*. Ph.D. dissertation, Universität Tübingen.
- Beck, Sigrid (1996b) "Quantified Structures as Barriers for LF Movement," *Natural Language Semantics 4*, pp. 1–56.
- Beck, Sigrid (2004) "A Semantic Explanation for Intervention Effects," in: *Proceedings von 'Sinn und Bedeutung' 8*.
- Beck, Sigrid (2006) "Intervention Effects Follow from Focus Interpretation," *Natural Language Semantics 14*, pp. 1–56.

- Becker, Misha (1999) "The *some* indefinites," paper presented at Colloque de Syntaxe et Semantique à Paris, October 1997. In: G. Storto (ed.) *Syntax at Sunset 2*, UCLA Working Papers in Linguistics vol. 3.
- Beghelli, Filippo & Tim Stowell (1995) "Distributivity and Negation," in: A. Szabolczi (ed.) *Ways of Scope Taking*. Kluwer, Dordrecht.
- Benmamoun, Elabbas (1997) "Licensing of negative polarity items in Moroccan Arabic," *Natural Language and Linguistic Theory* 15, pp. 263–287.
- Bierwisch, Manfred (1989) "Semantik der Graduierung," in: M. Bierwisch & E. Lang (eds.) *Grammatische und konzeptuelle Aspekte von Dimensionsadjektiven*. (Studia grammatica Vol. 16), Akademie Verlag, Berlin, pp. 91–286. [English version appeared 1989 as: "The semantics of gradation," in: M. Bierwisch & E. Lang (eds.) *Dimensional adjectives*. Springer-Verlag, Berlin, pp. 71–261.]
- Bolinger, Dwight (1960) "Linguistic science and linguistic engineering," *Word* 16, pp. 374–391.
- Bolinger, Dwight (1977) *Meaning and Form*. Longman, London.
- Bolinger, Dwight (1978) "Yes-no questions are not alternative questions," in: Hiz, H. (ed.) *Questions*. Reidel, Dordrecht.
- Borkin, Ann (1971) "Polarity Items in Questions," *Papers from the Seventh Regional Meeting of the Chicago Linguistic Society*, Chicago Linguistic Society, Chicago.
- Branco, António & Berthold Crysmann (1999) "Negative concord and the distribution of quantifiers," in: D'Hulst, Y. et al. (eds.) *Romance Languages and Linguistic Theory 1999*. Selected papers from 'Going Romance', Dec. '99, Leiden. John Benjamins, Amsterdam, pp. 39–62.
- Brugger, Gerhard & C. Poletto (1993) "On Negation in German and Bavarian," *University of Venice Working Papers in Linguistics* 3/2.
- Brunetti, Lisa (2003) 'Is there any difference between contrastive focus and information focus?' in: Matthias Weisgerber (ed.) *Proceedings of the Conference "sub 7 – Sinn und Bedeutung"*. *Arbeitspapier Nr. 114*. FB Sprachwissenschaft, Universität Konstanz.
- Büring, Daniel (1995) *The Meaning of Topic and Focus: The 59<sup>th</sup> Street Accent*. Ph.D. Diss., Universität Tübingen. Published (1997) by Routledge, London, New York.
- Büring, Daniel (2003) 'On D-Trees, Beans, and B-Accents,' *Linguistics & Philosophy* 26:5, pp. 511–545.
- Büring, Daniel & Christine Gunlogson (2000) *Aren't Positive and Negative Polar Questions the Same?* Ms., UCLA/UCSC.
- Büring, Daniel & Katharina Hartmann (2001) *V3 or not v3? An Investigation of German Focus Particles*. Ms., UCSC, Los Angeles and Univ. of Frankfurt.
- Burton-Roberts, Noel (1976) "On the generic indefinite article," *Language* 52, pp. 427–448.
- Carlson, Gregory N. (1977) *Reference to Kinds in English*. Ph.D. diss., University of Massachusetts at Amherst. Published (1980) by Garland Publishing, New York.
- Carlson, Gregory N. (1980) "Polarity any is Existential," *Linguistic Inquiry* 11/4, pp. 799–804.
- Carlson, Gregory N. (1981) "Distribution of Free-Choice Any," in: Henryk, Masek & Miller (eds.) *Papers from the Seventeenth Regional Meeting of the Chicago Linguistics Society*, CLS, Univ. of Chicago, pp. 8–23.
- Cheng, Lisa & Anastasia Giannakidou (2005) *The Non-uniformity of Wh-indeterminates with Free Choice in Chinese*. Ms., Univ. of Leiden and Univ. of Chicago.
- Chierchia, Gennaro (1998) "Reference to Kinds Across Languages," *Natural Language Semantics* 6, pp. 339–405.



- Chierchia, Gennaro (2001) *Scalar Implicatures, Polarity Phenomena, and the Syntax/Pragmatics Interface*. Ms., published in: A. Beletti (ed.) (2004) *Structures and Beyond*, Oxford University Press.
- Chierchia, Gennaro (2004) *Broaden your views. Implicatures of Domain Widening*. Ms., University of Milan – Bicocca.
- Chomsky, Noam (1970) "Remarks on Nominalizations," in: Jacobs, R. & P. Rosenbaum (eds.), *Readings in English Transformational Grammar*, Cambridge University Press, London, pp. 185–216.
- Chomsky, Noam (1971) "Deep Structure, Surface Structure, and Semantic Representation," in: D. D. Steinberg & L. A. Jakobovitz (eds.) *Semantics*. Cambridge University Press, Cambridge, pp. 193–217.
- Chomsky, Noam (1995) *The minimalist program*. MIT Press, Cambridge, Mass.
- Chomsky, Noam (1999) *Derivation by Phase*. MITOPL 18.
- Chomsky, Noam. (2001) "Derivation by phase," in: Michael Kenstowicz (ed.) *Ken Hale: A life in language*. MIT Press, Massachusetts, pp. 1–52.
- Chomsky, Noam. (2004) "Beyond explanatory adequacy," in: Adriana Belletti (ed.) *The cartography of syntactic structures*. Vol. 3, *Structures and beyond*, Oxford University Press, Oxford.
- Cinque, Guglielmo (1993) "A null theory of phrase and compound stress," *Linguistic Inquiry* 24, pp. 239–267.
- Corblin, Francis & Lucia Tovenà (1999) "On the multiple expression of negation in Romance," in: D'Hulst, Y. et al. (eds.) *Romance Languages and Linguistic Theory 1999*. Selected papers from 'Going Romance', Dec. '99, Leiden. John Benjamins, Amsterdam, pp. 87–115.
- Cresswell, M.J. (1976) "The semantics of degrees," in: Partee, B. (ed.) *Montague Grammar*. Academic Press, New York, pp. 261–292.
- Dahl, Östen (1970) "Some notes on indefinites," *Lanugage* 46, pp. 33–41.
- Davison, Alice (1979) "Any as Universal or Existential," in Jan. van der Auwera (ed.), *The Syntax of Determiners*, Croom Helm, London, pp. 11–40.
- Dayal, Veneeta (1995) "Licensing any in non-negative non-modal contexts," *Proceedings of SALT 5*.
- Dayal, Veneeta (1997) "Free Relatives and Ever, Identity and Free Choice Readings," in: Lawson, A. (ed.) *Proceedings of SALT 7*, Ithaca, N.Y.: Cornell University, CLC Publications, pp. 99–116.
- Dayal, Veneeta (1998) "Any as inherently modal," *Linguistics and Philosophy* 21, pp. 433–476.
- Dayal, Veneeta (2004) "The universal force of free choice any," Ms., to appear in: *Linguistic Variation Yearbook 2005*. [<http://semanticsarchive.net/Archive/TU0NjY3Z/Universal-any.pdf>]
- De Morgan, Augustus (1861) *Letter to George Boole*, reprinted in G.C. Smirth (ed.) *The Boole-DeMorgan Correspondance 1842-1864*. Oxford: Clarendon Press, 1982.
- De Morgan, Augustus (1862) *On the Syllogism: V*, reprinted in P. Heath (ed.), *On the Syllogism and Other Logical Writings by Augustus DeMorgan*, 208-46. London: Routledge & Kegan Paul, 1966.
- Déprez, Viviane (1997) "Two types of negative concord," *Probus* 9, pp. 103–143.
- Diesing, Molly (1992) *Indefinites*. MIT Press, Cambridge MA.
- Dikken, Marcel den (2001) *A polar whole. Dutch heel 'whole' as a special kind of negative polarity item*. Ms., City University of New York.
- Dikken, Marcel den & Anastasia Giannakidou (2002) "From Hell to Polarity: 'Aggressively Non-D-Linked' Wh-Phrases as Polarity Items," *Linguistic Inquiry* 33/1, pp. 31–61.

- Dowty, David R. (1993) "Deductive versus semantic accounts of reasoning: the relevance of negative polarity and negative concord marking," in: *Twentieth Regional Meeting of the Chicago Linguistics Society*, pp. 91–124.
- Dowty, David R. (1994) *Monotonicity-based logic and why natural languages have negative polarity and negative concord marking*. Ms.
- Dowty, David R. (1994) "The role of negative polarity and concord marking in natural language reasoning," in: *Proceedings of Semantics and Linguistic Theory IV*, pp. 114–144.
- É. Kiss, Katalin (1998) 'Identificational Focus versus information focus,' *Language* 74, pp. 245–273.
- Eisner, Jason (1995) "∀-less in Wonderland? Revisiting *Any*," in J. Fuller et al., eds., *Proceedings of ESCOL 11* (1994), Ithaca, NY: DMLL Publications.
- Enç, Mürvet (1991) "The semantics of specificity," *Linguistic Inquiry* 22, pp. 1–25.
- Erteschik-Shir, Nomi (1997) *The Dynamics of Focus Structure*. Cambridge University Press, Cambridge.
- Fauconnier, Gilles (1975a) "Polarity and the Scale Principle," *Papers from the Eleventh Meeting of the Chicago Linguistic Society*, Chicago Linguistic Society, pp. 188–199.
- Fauconnier, Gilles (1975b) "Pragmatic Scales and Logical Structure," *Linguistic Inquiry* 6/3, pp. 353–375.
- Fauconnier, Gilles (1979) "Implication reversal in a natural language," in: F. Guenther & S.J. Schmidt (eds.) *Formal Semantics and Pragmatics for Natural Languages*. Reidel, Dordrecht, pp. 289–301.
- Fauconnier, Gilles (1980) "Pragmatics, Entailment and Questions," in: J.R. Searle, F. Kiefer & M. Bierwisch (eds.) *Speech Act Theory and Pragmatics*, Reidel, Dordrecht, pp. 57–69.
- Fine, Kit (1985) *Reasoning with Arbitrary Objects*. Basil Blackwell, Oxford.
- Fintel, Kai von (1999) "NPI-licensing, Strawson entailment and questions," *Journal of Semantics* 16, pp. 97–148.
- Fintel, Kai von (2000) "Whatever," in: Jackson, B. & T. Matthews (eds.) *Proceedings of SALT 10*, Ithaca, N.Y.: Cornell University, CLC Publications.
- Fox, Danny (2006) *Free Choice and the theory of Scalar Implicatures*. Ms., MIT.
- Gazdar, G. (1979) *Pragmatics*. Academic Press, New York.
- Geurts, Bart (1996) "On *No*," *Journal of Semantics* 13, pp. 67–86.
- Giannakidou, Anastasia (1996) *Licensing 'Negative Polarity Items' in Greek*. Talk given at the Linguistics Seminar, UCLA, Feb. '96.
- Giannakidou, Anastasia (1997) *The Landscape of Polarity Items*. Ph. D. Diss., University of Groningen.
- Giannakidou, Anastasia (1998) *Polarity Sensitivity as (Non)veridical Dependency*. John Benjamins, Amsterdam.
- Giannakidou, Anastasia (2000) "Negative ... concord?" *Natural Language and Linguistic Theory* 18, pp. 457–523.
- Giannakidou, Anastasia (2001) "The meaning of free choice," *Linguistics and Philosophy* 24, pp. 659–735.
- Giannakidou, Anastasia (2002) "N-words and negative concord," in: Henk van Riemsdijk, Rob Goedemans et al. (eds.) *The Syntax Companion*, Netherlands Institute for Advanced Studies (NIAS), Royal Dutch Academy of Sciences (KNAW). In press with Blackwell, Oxford. Available in on-line encyclopedia. [<http://home.uchicago.edu/~giannaki/pubs/nwords.pdf>]
- Giannakidou, Anastasia & Josep Quer (1997) "Long-distance Licensing of Negative Indefinites," in: Danielle Forget et al. (eds.) *Negation and Polarity: Syntax and Semantics*, John Benjamins, Amsterdam, pp. 95–113.

- Giannakidou, Anastasia & Lisa Cheng (2005) *(In)Definiteness, polarity, and the role of wh-morphology in free choice*. Ms., Univ. of Chicago and Univ. of Leiden.
- Givón, Talmy (1978) "Negation in Language: Pragmatics, Function, Ontology," *Syntax and Semantics* 9, pp. 69–112.
- Grice, Paul (1967) *Logic and Conversation*. William James Lectures, Harvard University. Published in P. Grice (1989) *Studied in the Ways of Words*. Harvard University Press, Cambridge, MA.
- Grice, Paul (1975) "Logic and Conversation," *Syntax and Semantics* 3, pp. 41–58.
- Groenendijk, J. & M. Stokhof (1984) *Studies in the Semantics of Questions and the Pragmatics of Answers*. Ph.D. thesis, University of Amsterdam.
- Guerzoni, Elena (2001) "Even-NPIs in questions," in Rooy, R. van & M. Stokhof (eds.), *Proceedings of the 13<sup>th</sup> Amsterdam Colloquium*, Amsterdam.
- Guerzoni, Elena (2003) *Why even ask? On the Pragmatics of Questions and the Semantics of Answers*. Ph.D. Dissertation, MIT.
- Guerzoni, Elena & Yael Sharvit (2004) *A Question of Strength: On NPIs in Interrogative Clauses*. Ms., University of Southern California and University of Connecticut.
- Haegeman, Liliane (1995) *The Syntax of Negation*, Cambridge Studies in Linguistics 75, Cambridge University Press.
- Haegeman, Liliane & Raffaella Zanuttini (1991) "Negative Heads and the NEG-criterion," *The Linguistic Review* 8, pp. 233–251.
- Hagstrom, Paul (1998) *Decomposing Questions*. Ph.D. dissertation, MIT, Cambridge, Mass.
- Hajičová, Eva, Barbara Partee & Petr Sgall (1998) *Topic-Focus Articulation, Tripartite Structures, and Semantic Content*. Kluwer, Dordrecht.
- Hamblin, C.L. (1973) "Questions in Montague English," *Foundations of Language* 10, pp. 41–53.
- Hamilton, Sir William (1858) *Discussions on Philosophy and Literature*. Harper & Brothers, New York.
- Han, C. H. & L. Siegel (1996) "Syntactic and semantic conditions on NPI licensing in questions," in: *Proceedings of WCCFL 15*.
- Hasegawa, N. (1991) "Affirmative Polarity Items and Negation in Japanese," in: C. Georgopoulos & R. Ishihara (eds.), *Interdisciplinary Approaches to Language*. Kluwer Academic Publishers, pp. 271–286.
- Haspelmath, Martin (1993) *A Typological Study of Indefinite Pronouns*. Ph.D. dissertation, Freie Universität Berlin.
- Haspelmath, Martin (1997) *Indefinite Pronouns*. Clarendon, Oxford.
- Heck, Fabian & Uli Sauerland (2003) "LF Intervention Effects in Pied-Piping," *Proceedings of NELS 2002*, MIT.
- Heim, Irene (1982) *The Semantics of Definite and Indefinite Noun Phrases*, Ph.D. Dissertation, Univ. of Massachusetts, Amherst.
- Heim, Irene (1984) "A Note on Negative Polarity and Downward Entailingness," in: C. Jones & P. Sells (eds.) *Proceedings of NELS 14, GLSA*, Ling. Dept., Univ. of Massachusetts, Amherst.
- Heim, Irene (1985) "Notes on comparatives and related matters," Ms., University of Texas, Austin.
- Heim, Irene (1992) "Presupposition projection and the semantics of attitude verbs," *Journal of Semantics* 9, pp. 183–221.
- Heim, Irene (2000) "Degree operators and scope," in: Jackson, B. & T. Matthews (eds.) *Proceedings of Semantics and Linguistic Theory 10*, CLC Publications, Cornell University, Ithaca, NY.
- Heim, Irene & Angelika Kratzer (1998) *Semantics in Generative Grammar*. Blackwell, Oxford.

- Herburger, Elena (2000) *What Counts: Focus and Quantification*. MIT Press, Cambridge, MA.
- Herburger, Elena (2004) 'Nur' und das Verhältnis der Syntax zur Semantik. Talk given at the Inst. f. Sprachwiss., Univ. of Vienna, 29. 10. 2004.
- Heusinger, Klaus von (2002) 'Information Structure and the Partition of Sentence Meaning,' to appear in: E. Hajičová, T. Hoskovec & P. Sgall (eds.) *Form, Meaning and Function. Travaux du Cercle Linguistique de Prague n.s. / Prague Linguistic Circle Papers 4*. Benjamins, Amsterdam, Philadelphia, pp. 275-305.
- Heycock, Caroline & Roberto Zamparelli (2003) *Friends and colleagues: Plurality, coordination, and the structure of DP*, Ms., Univ. of Edinburgh, Univ. of Bergamo.
- Hirschberg, Julia (1985) *A theory of scalar implicature*. Ph.D. dissertation, University of Pennsylvania.
- Hoeksema, Jack (1983) "Negative Polarity and the Comparative," *Natural Language and the Linguistic Theory 1*, pp. 403–434.
- Hoeksema, Jack (1986) "Monotonicity phenomena in natural language," *Linguistic Analysis 16*, pp. 25–40.
- Hoeksema, Jack (1994) "On the grammaticalization of negative polarity items," in: Gahl, S. et al. (eds.), *Proceedings of the 20<sup>th</sup> Annual Meeting of the Berkeley Linguistic Society*, pp. 273–282.
- Hoeksema, Jack (2000) "Negative Polarity Items: Triggering, Scope, and C-command," in: Horn, L. & Y. Kato (eds.) *Negation and Polarity*, Oxford University Press, pp. 115–146.
- Hoeksema, Jack & Hotze Rullmann (2001) "Scalarity and Polarity. A Study of Scalar Adverbs as Polarity Items," in: J. Hoeksema, H. Rullmann, V. Sanchez-Valencia & T. van der Wouden (eds.) *Perspectives on Negation and Polarity*. John Benjamins, Amsterdam, pp. 129–171.
- Hoeksema, Jack & Frans Zwarts (1991) "Some remarks on focus adverbs," *Journal of Semantics 8*, pp. 51–70.
- Hoepelman, Jaap & Christian Rohrer (1981) "Remarks on *noch* and *schon* in German," in: Philip J. Tedeschi & Annie Zaenen (eds.), *Syntax and Semantics 14: Tense and Aspect*. Academic Press, New York, pp. 103–126.
- Horn Laurence (1969) "A presuppositional Analysis of Only and Even," *Papers from the Fifth Regional Meeting of the Chicago Linguistics Society, CLS, Chicago*, pp. 98–107.
- Horn, Laurence (1970) "Ain't it hard (anymore)," *Papers from the Sixth Regional Meeting of the Chicago Linguistic Society, CLS, Chicago*, pp. 318–327.
- Horn, Laurence (1972) *On the Semantic Properties of Logical Operators in English*. Ph.D. Diss., UCLA, reprinted by Indiana University Linguistics Club, 1976.
- Horn, Laurence (1978) "Remarks on Neg-Raising," *Syntax and Semantics 9*, pp. 129–220.
- Horn, Laurence (1986) "Presupposition, Theme and Variations," *Chicago Linguistic Society 22*, pp. 168–192.
- Horn, Laurence (1989) *A Natural History of Negation*. Univ. of Chicago Press, Chicago and London.
- Horn, Laurence (1996) "Exclusive company: Only and the dynamics of vertical inference," *Journal of Semantics 13*, pp. 1–40.
- Horn, Laurence (2000a) "Any and (-)ever: Free choice and free relatives," in: Wyner, A. Z. (ed.) *Proceedings of the 15<sup>th</sup> Annual Conference of the Israeli Association for Theoretical Linguistics*, pp. 71–111.
- Horn, Laurence (2000b) "Pick a theory (not just any theory): Indiscriminatives and the free-choice indefinite," in: Horn, L. & Y. Kato (eds.) *Studies in Negation and Polarity*, Oxford University Press, pp. 147–192.
- Horn, Laurence & Young-Suk Lee (1995) *How many any's?* Paper presented at the annual meeting of the LSA, New Orleans.

- Israel, Michael (1996) "Polarity sensitivity as lexical semantics," *Linguistics and Philosophy* 19, pp. 619–666.
- Israel, Michael (1998) *Ever: polysemy and polarity sensitivity*. Paper presented at the annual meeting of the Linguistic Society of America, New York.
- Israel, Michael (2001) "Minimizers, maximizers and the rhetoric of scalar reasoning," *Journal of Semantics* 18, pp. 297–331.
- Jackendoff, Ray (1969) "An Interpretive Theory of Negation," *Foundations of Language* 5, pp. 218–214.
- Jackendoff, Ray S. (1971) "On some questionable arguments about quantifiers and negation," *Language* 47, pp. 282–298.
- Jackendoff, Ray (1972) *Semantic Interpretation in Generative Grammar*. MIT Press, Cambridge MA.
- Jacobs, Joachim (1982) *Syntax und Semantik der Negation im Deutschen*. Fink, München.
- Jacobs, Joachim (1983) *Fokus und Skalen. Zur Syntax und Semantik von Gradpartikeln im Deutschen*. Niemeyer, Tübingen.
- Jacobs, Joachim. (1984) "Funktionale Satzperspektive und Illokutionssemantik," *Linguistische Berichte* 91, pp. 25–58.
- Jacobs, Joachim (1991) "Negation," in: Stechow, Arnim v. & Dieter Wunderlich (eds.), *Semantics: An International Handbook of Contemporary Research*, de Gruyter, Berlin, pp. 560–596.
- Jacobs, Joachim (1991) "Focus Ambiguities," *Journal of Semantics* 8, pp. 1–36.
- Jacobson, Pauline (1995) "On the Quantificational Force of English Free Relatives," in: E. Bach et al. (eds) *Quantification in Natural Language*. Kluwer Academic Publishers, Dordrecht.
- Jennings, R.E. (1994) *The Genealogy of Disjunction*. Oxford University Press, New York.
- Jespersen, Otto (1917) *Negation in English and Other Languages*. A. F. Host, Copenhagen; reprinted in Selected Writings of Otto Jespersen (1962), George Allen and Unwin Ltd., pp. 3–151
- Kadmon, Nirit (2001) *Formal Pragmatics*. Blackwell, Oxford.
- Kadmon, Nirit & Fred Landman (1989) "Polarity sensitive any and free choice any," in: *Seventh Amsterdam Colloquium*, pp. 227–251.
- Kadmon, Nirit & Fred Landmann (1993) "Any," *Linguistics and Philosophy* 16, pp. 353–422.
- Kamp, Hans (1981) "A Theory of Truth and Discourse Representation," in: J. Groenendijk, T. Janssen & M. Stokhof (eds.) *Formal Methods in the Study of Language*. Mathematical Centre, Amsterdam.
- Kamp, Hans & Uwe Reyle (1993) *From Discourse to Logic. Introduction to Modeltheoretic Semantics of Natural Language, Formal Logic and Discourse Representation Theory*. Kluwer, Dordrecht.
- Kas, Mark (1993) *Essays on Boolean Functions and Negative Polarity*. Ph.D. thesis, University of Groningen, Dissertations in Linguistics 11.
- Karttunen, Lauri (1971) "Conditionals and Polarity Reversal," *Papers in Linguistics* 4/2.
- Karttunen, Lauri (1974) "Until," *Papers from the 10<sup>th</sup> Regional Meeting of the Chicago Linguistic Society*. Chicago Linguistics Society, Chicago, pp. 284–297.
- Karttunen, Lauri (1977) "Syntax and Semantics of Questions," *Linguistics and Philosophy* 1, pp. 3–44.
- Karttunen, Lauri & S. Peters (1979) "Conventional Implicature," in: C.-K. Oh & D. Dinneen (eds.), *Syntax and Semantics 11*, Academic Press, New York.
- Katz, Jerrold J. & Paul M. Postal (1964) *An Integrated Theory of Linguistic Descriptions*, Cambridge.
- Kay, P. (1990) "Even," *Linguistics and Philosophy* 13, pp. 59–111.
- Kempson, Ruth M. (1985) "More on any: Reply to Ladusaw," *North-Eastern Linguistic Society* 15, pp. 234–255.

- Kennedy, Christopher (1997) *Projecting the adjective*. Ph.D. dissertation, University of California, Santa Cruz. [Published 1999, Garland Press.]
- Kennedy, Christopher (2001a) "On the monotonicity of polar adjectives," in: Jack Hoeksema, H. Rullmann, V. Sánchez-Valencia & T.v.d. Wouden (eds.) *Perspectives on negation and polarity items*, John Benjamins, Amsterdam, pp. 201–221.
- Kennedy, Christopher (2001b) "Polar Opposition and the Ontology of Degrees," *Linguistics and Philosophy* 24/1, pp. 33–70.
- Kennedy, Christopher (2004) "Comparatives, Semantics of," ms., to appear in: the Lexical and Logical Semantics section of the *Encyclopedia of Language and Linguistics*, 2<sup>nd</sup> edition. Keith Allen (section editor), Elsevier, Oxford.
- Kennedy, Christopher & Louise McNally (2002) *Scale structure and the semantic typology of gradable predicates*. Ms. [<http://semanticsarchive.net/Archive/zU5MjNiN/km-scales.pdf>].
- Kennedy, Christopher & Louise McNally (2005) "The syntax and semantics of multiple degree modification in English," in: Stefan Müller (ed.) *Proceedings of the HPSG05 Conference*, Dept. of Informatics, University of Lisbon. CSLI Publications, pp. 178–191.
- Kiparsky, Paul & Carol Kiparsky (1970) "Fact," in: M. Bierwisch & K. E. Heidolph (eds.), *Progress in Linguistics*. Mouton.
- Kitagawa, Yoshihisa, Dorian Roehrs & Satoshi Tomioka (2003) *Multiple Wh-interpretations*. Ms., Indiana University and University of Delaware. To appear in the Proceedings of GLOW in Asia 2003.
- Klein, E. (1991) "A semantics for positive and comparative adjectives," *Linguistics and Philosophy* 4, pp. 1–45.
- Klima, Edward S. (1964) "Negation in English," in J. Fodor & J. Katz (eds.) *The Structure of Language*. Prentice-Hall, Englewood Cliffs.
- Klopp, A. von (1998) "An alternative view of polarity items," *Linguistics and Philosophy* 16, pp. 393–432.
- Koktová, Eva (1987) "On sopng properties of negation, focusing particles and sentence adverbials," *Theoretical Linguistics* 14, 173–226.
- König, Ekkehard (1977) "Temporal and non-temporal uses of *schon* and *noch* in German," *Linguistics and Philosophy* 1, pp. 173–198.
- König, Ekkehard (1991) *The Meaning of Focus Particles*. Routledge, London.
- Kratzer, Angelika (1988) "Stage-level and individual-level predicates," in: M. Krifka (ed.) *Genericity in Natural Language*. Narr, Tübingen, pp. 247–284.
- Kratzer, Angelika (2004) *Indefinites and the Operators they Depend on: From Japanese to Salish*. Ms. University of Massachusetts at Amherst. To appear in: G. N. Carlson & F.J. Pelletier (eds.) *Reference and Quantification: The Partee Effect*. CSLI.
- Kratzer, Angelika and Junko Shimoyama: (2002) "Indeterminate Pronouns: The View from Japanese," Paper presented at the 3<sup>rd</sup> Tokyo Conference on Psycholinguistics.
- Krifka, Manfred (1990) "Polarity Phenomena and Alternative Semantics," in: Stokhof, M. & L. Torenvliet (eds.) *Proceedings of the Seventh Amsterdam Colloquium, Part I*, ITLI publication, University of Amsterdam, pp. 277–301.
- Krifka, Manfred (1992) "Some remarks on polarity items," in Zaefferer, D. (ed.), *Semantic Universals and Universal Semantics*, Foris Publications, Berlin.
- Krifka, Manfred (1994) "The semantics and pragmatics of weak and strong polarity items in assertions," in: *Proceedings of Semantics and Linguistic Theory IV*, pp. 195–219.

- Krifka, Manfred (1995) "The Semantics and Pragmatics of Polarity Items," *Linguistic Analysis* 25, pp. 209–257.
- Krifka, Manfred (1998) "Additive particles under stress," in: D. Strolovitch & A. Lawson (eds.) *Proceedings from Semantics and Linguistic Theory VIII*. CLC Publications, Cornell University, Ithaca, NY, pp. 111–128.
- Labov, W. (1972) "Negative Attraction and Negative Concord," *Language* 48, pp. 773–818.
- Ladusaw, William A. (1979) *Polarity Sensitivity as Inherent Scope Relations*, Ph. D. Diss., Univ. of Texas, Austin.
- Ladusaw, William A. (1980) "On the Notion Affective in the Analysis of Negative Polarity Items," *Journal of Linguistic Research* 1, pp. 1–16.
- Ladusaw, William A. (1983) "Logical Form and Conditions on Grammaticality," *Linguistics and Philosophy* 6, pp. 373–392.
- Ladusaw, William A. (1991) *Interpreting Negative Concord Structures*, Santa Cruz Linguistic Institute.
- Ladusaw, William A. (1992) "Expressing negation," in: *Proceedings of Semantics and Linguistic Theory I*, pp. 237–260.
- Ladusaw, William A. (1996) "Negation and Polarity Items," in Sh. Lappin (ed.) *The Handbook of Contemporary Semantic Theory*, Blackwell, pp. 321–341.
- Lahiri, Utpal (1996) *The Syntax and Semantics of Indefinite+Bhii Phrases in Hindi*. Ms., Univ. of California-Irvine.
- Lahiri, Utpal (1998) "Focus and Negative Polarity in Hindi," *Natural Language Semantics*, 6, pp. 57–125.
- Laka, Itziar (1990) *Negation in Syntax: on the Nature of Functional Categories and Projections*, Ph.D. thesis, MIT.
- Lakoff, Robin (1969) "Some Reasons why there can't be any *some-any* Rule," *Language* 45, pp. 608–615.
- Lappin, Shalom (ed.) (1996) *The handbook of contemporary semantic theory*. Blackwell, London.
- Lasnik, Howard (1972) *Analyses of Negation in English*. Ph.D. dissertation, MIT.
- Lasnik, Howard (1975) "On the Semantics of Negation," in: Hockney et al. (eds.) *Contemporary Research in Philosophical Logic and Linguistic Semantics*, Reidel, Dordrecht.
- Lawler, John M. (1971) "Any Questions?" *Papers from the Seventh Regional Meeting of the Chicago Linguistic Society*, CLS, pp. 163–174.
- Lechner, Winfried (1999) *Comparatives and DP structure*. Ph.D. dissertation, University of Massachusetts, Amherst.
- Lechner, Winfried (2001) "Reduced and Phrasal Comparatives," *Natural Language and Linguistic Theory* 19, pp. 683–745.
- Lee, Chungmin (1996) "Negative polarity items in English and Korean," *Lang. Sci.* 18, 505–523.
- Lee, Felicia (1994) *Negative polarity licensing in wh-questions*. MA thesis, UCLA.
- Lee, Young-Suk. & Lawrence Horn (1994) *Any as Indefinite plus Even*, Ms., Yale University.
- LeGrand, Jean Ehrenkranz (1974) "AND and OR: some SOMEs and all ANYs," *Papers from the Tenth Regional Meeting of the Chicago Linguistic Society*, CLS, pp. 390–401.
- LeGrand, Jean Ehrenkranz (1975) *Or and Any: The Semantics and Syntax of Two Logical Operators*. University of Chicago dissertation.
- Lewis, David (1970) "General Semantics," *Synthese* 22, pp. 18–67.
- Lin, Jo-Wang (1995) *On the Nature of Existential Polarity Wh-Phrases*, Ms., UMass.

- Lin, Jo-Wang (1996) *Polarity Licensing and Wh-Phrase Quantification in Chinese*. Ph.D. diss., University of Massachusetts, Amherst.
- Lin, Jo-Wang (1998) "On Existential Polarity Wh-Phrases in Chinese," *Journal of East Asian Linguistics* 7, pp. 219–255.
- Lin, Jo-Wang (2002) *On choice functions and scope of existential polarity wh-phrases in Mandarin Chinese*. Paper presented at GLOW in Asia, Jan. 4–6, 2002, Tsinghua University, Taiwan.
- Linebarger, Marcia C. (1980) *The Grammar of Negative Polarity*, Ph.D. Diss., MIT, Cambridge, Mass.
- Linebarger, Marcia C. (1987) "Negative Polarity and Grammatical Representation," *Linguistics and Philosophy* 10, pp. 325–387.
- Löbner, Sebastian (1989) "German *schon - erst - noch*: an integrated analysis," *Linguistics and Philosophy* 12, pp. 167–212.
- Matthewson, Lisa (1996) "The semantics of Salish determiners: a parametric account," talk given at WCFFL, U.C.Irvine.
- Meier, Cécile (2001) "Multihead Comparatives and Result Clause Constructions with 'Split Antecedents'," in: C. Féry & W. Sternefeld (eds.) *Audiatur Vox Sapientiae: A Festschrift for Arnim von Stechow*. Volume 52 of *Studia Grammatica*, Akademie Verlag, Berlin, pp. 348–371.
- Meier, Cécile (2003) "The meaning of *too, enough* and *so ... that*," *Natural Language Semantics* 11, pp. 69–107.
- Michaelis, Laura (1996) "On the use and meaning of *already*," *Linguistics and Philosophy* 19, pp. 477–502.
- Mittwoch, A. (1977) "Negative Sentences with *Until*," *Papers from the 13<sup>th</sup> Regional Meeting of the Chicago Linguistic Society*. Chicago Linguistic Society, Chicago, pp. 410–417.
- Mittwoch, A. (2001) "Perfective sentences under negation and durative adverbials," in: J. Hoeksema, H. Rullmann, V. Sanchez-Valencia & T. van der Wouden (eds.) *Perspectives on Negation and Polarity*. John Benjamins, Amsterdam, pp. 265–288.
- Neubarth, Friedrich (1995) *Polarity: Negative*. MA thesis, Univ. of Vienna.
- Partee, Barbara H. (1991) "Topic, focus and quantification," in: S. Moore & A. Wyner (eds.) *Proceedings of SALT 1*. Cornell University Working Papers in Linguistics, Cornell Univ., Ithaca, NY, pp. 159–187.
- Paul, Hermann (1919) *Deutsche Grammatik*, Bd. III (Syntax), 1959 (5. Aufl.), Niemeyer Verlag, Halle (Saale).
- Penka, Doris (2002) *Kein muß kein Rätsel sein. Zur Semantik der negativen Indefinita im Deutschen*. MA thesis, Universität Tübingen.
- Penka, Doris & Arnim v. Stechow (2002) "Negative Indefinita unter Modalverben," in: Reimar Müller & Marga Reis (eds.) *Modalität und Modalverben im Deutschen*. Helmut Buske, Hamburg, pp. 263–286.
- Penka, Doris & Zeijlstra, Hedde (2005) *Negative Indefinites in Dutch and German*. Paper presented at 20<sup>th</sup> Comparative Germanic Syntax Workshop, Tilburg.
- Perlmutter, David (1970) "On the article in English," in: Manfred Bierwisch & K. Heidolph (eds.) *Progress in Linguistics*. Mouton, De Hague, pp. 233–248.
- Pesetsky, David (2000) *Phrasal Movement and its Kin*. MIT Press.
- Pope, E. (1972) *Questions and Answers in English*, Ph.D. Diss., MIT, Cambridge, Mass.
- Postal, Paul M. (2000). "A Remark on English Double Negatives," in: Laporte, Eric, Christian Leclère, Mireille Piot & Max Silberstein (eds.) *Syntaxe, Lexique et Lexique-Grammaire*. *Linguisticae Investigationes Supplementa* 24, John Benjamins, Amsterdam and Philadelphia.



- Progovac, Ljiljana (1988) *A Binding Approach to Polarity Sensitivity*, Ph.D. thesis, USC, Los Angeles.
- Progovac, Ljiljana (1990) "Free-Choice Bilo in Serbo-Croatian: Existential or Universal?" *Linguistic Inquiry* 21/1, pp. 130–135.
- Progovac, Ljiljana (1992a) "Non-Negative Polarity Licensing must involve COMP," *Linguistic Inquiry* 23/2, pp. 341–347.
- Progovac, Ljiljana (1992b) "Negative Polarity: A Semantico-Syntactic Approach," *Lingua* 86, pp. 271–299.
- Progovac, Ljiljana (1993) "Negative polarity: entailment and binding," *Linguistics and Philosophy* 16, pp. 149–180.
- Progovac, Ljiljana (1994) *Negative and Positive Polarity: A Binding Approach*. Cambridge Studies in Linguistics 68, Cambridge University Press.
- Quer, Josep (1993) *The Syntactic Licensing of Negative Items*. MA thesis, Universitat Autònoma de Barcelona.
- Quer, Josep (1994) "Distinguishing between negative and nonnegative licensing of negative items," in: *Proceedings of the Colloquium de Grammatica Generativa*, Tarragona.
- Quine, W.V.O. (1960) *Word and Object*. Cambridge: MIT Press.
- Ramchand, Gillian (1997) "Questions, polarity and alternative semantics," In: K. Kusumoto (ed.) *Proceedings of NELS 27*, Amherst, University of Massachusetts, GLSA, pp. 383–396.
- Reich, Ingo (2002) "Association with Focus, Islands, and Choice Functions: A Binding Approach," in: K. von Stechow, R. Kempson & W. Meyer-Viol (eds.) *Proceedings of the Workshop "Choice Functions and Natural Language Semantics"*. Arbeitspapier 110, Universität Konstanz, pp. 167–188.
- Reichenbach, Hans (1947) *Elements of Symbolic Logic*. New York: The Free Press.
- Reinhart, Tanya (1976) "Polarity Reversal: Logic or Pragmatics," *Linguistic Inquiry* 7/4, pp. 697–705.
- Reinhart, Tanya (1981) "Pragmatics and linguistics: an analysis of sentence topics," *Philosophica* 27, pp. 53–94.
- Reinhart, Tanya (1997) "Quantifier Scope: How Labor is Divided Between QR and Choice Functions," *Linguistics and Philosophy* 20, pp. 335–397.
- Reis, Marga & Inger Rosengren (1997) "A modular approach to the grammar of additive particles: the case of German *auch*," *Journal of Semantics* 14, pp. 237–309.
- de Rijk, L.M. (ed.) (1992) *Peter of Spain: Syncategoreumata*, translation J. Spruyt. Leiden: Brill.
- Rohrbaugh, E. (1997) "The role of focus in the licensing and interpretation of negative polarity items," in: Forget, D. et al. (eds.) *Negation and Polarity: Syntax and Semantics*. John Benjamins, Amsterdam, pp. 311–321.
- Rooth, Mats (1985) *Association with Focus*. Ph.D. thesis, University of Amherst, Massachusetts.
- Rooth, Mats (1992) "A theory of Focus Interpretation," *Natural Language Semantics* 1, pp. 75–116.
- Rooth, Mats (1996) "Focus," in Lappin (ed. ) *The handbook of contemporary semantic theory*. Blackwell, London, pp. 271–297.
- Rooth, Mats (1999) "Association with focus or association with presupposition?" in: P. Bosch & R. van der Sandt (eds.) *Focus*. Cambridge University Press, Cambridge, pp. 232–244.
- Rooy, Robert van (2002) *Negative Polarity Items in Questions: Strength as Relevance*. Ms., Univ. Amsterdam.
- Ross, John R. (1967) *Constraints on Variables in Syntax*, Ph.D. Diss., MIT, Cambridge, Mass.
- Rullmann, Hotze (1995) *Maximality in the Semantics of Wh-Constructions*. Ph.D. diss., Univ. of Massachusetts, Amherst.

- Rullmann, Hotze (1996) "Two types of negative polarity items," in: Kusumoto, K. (ed.) *Proceedings of NELS 26*, Amherst, Univ. of Massachusetts.
- Rullmann, Hotze (1997) "Even, polarity, and scope," in: M. Gibson, G. Wiebe & G. Libben (eds.) *Papers in Experimental and Theoretical Linguistics*. Dept. of Linguistics, Univ. of Alberta, Edmonton, pp. 40–64.
- Rullmann, Hotze (2003) "Additive Particles and Polarity," *Journal of Semantics* 20, pp. 329–401.
- Rullmann, Hotze & Sigrid Beck (1998) "Presupposition Projection and the Interpretation of which-Questions," *Proceedings of SALT 8*, Cornell University, pp. 215–232.
- Russell, Bertrand (1905) "On denoting," *Mind* 14, pp. 479–493.
- Saebø, K.J. (2001) "The Semantics of Scandinavian Free Choice Items," *Linguistics and Philosophy* 24(6), pp. 737–787.
- Sadock, Jerrold (1971) "Queclaratives," *Papers from the 7<sup>th</sup> Regional Meeting of the Chicago Linguistic Society*, CLS 7, pp. 223–231.
- Sánchez Valencia, Victor, Ton van der Wouden & Frans Zwarts (1993) "Polarity, veridicality, and temporal connectives," in: Dekker, P. & M. Stokhof (eds.) *Proceedings of the 9<sup>th</sup> Amsterdam Colloquium*, ILLC-University of Amsterdam, pp. 587–606.
- Sauerland, Uli (2004) "Scalar Implicatures in Complex Sentences," *Linguistics & Philosophy* 27, pp. 367–391.
- Sauerland, Uli & Fabian Heck (2003) "LF-Intervention Effects in Pied-Piping," in: M. Kadowaki & S. Kawahara (eds.) *Proceedings of NELS 33*, GLSA Publications, Amherst, Mass.
- Schmerling, Susan (1971) "A Note On Negative Polarity," *Papers in Linguistics* 4/1.
- Schwarzschild, Roger (1999) "GIVENness, Avoid F and other Constraints on the Placement of Focus," *Natural Language Semantics*, 7(2), pp. 141–177.
- Schwarzschild, Roger & Karina Wilkinson (2002) "Quantifiers in comparatives: A semantics of degree based on intervals," *Natural Language Semantics* 10, pp. 93–116.
- Sedivy, J. (1990) "Against a Unified Analysis of Negative Polarity Licensing," *Cahiers Linguistiques D'Ottawa* 18, Univ. of Ottawa, pp. 95–105.
- Selkirk, Elisabeth (1984) *Phonology and Syntax*. MIT Press, Cambridge, MA.
- Seuren, Pieter A.M. (1973) "The comparative," in: F. Kiefer & N. Ruwet (eds.) *Generative grammar in Europe*, Reidel, Dordrecht.
- Seuren, Pieter A.M. (1978) "The structure and selection of positive and negative gradable adjectives," in: W.M. Jacobsen, D. Farkas & K.W. Todrys (eds.) *Papers from the Parasession on the Lexicon, Chicago Linguistics Society*, CLS, Chicago, pp. 336–346.
- Seuren, Pieter A.M. (1984) "The comparative revisited," *Journal of Semantics* 3, pp. 109–141.
- Sommers, Fred (1982) App. C: "Any", *The Logic of Natural Language*. Clarendon, Oxford.
- Stalnaker, Robert (1972) "Pragmatics," in: D. Davidson & G. Harman (eds.) *Semantics of Natural Language*, North Holland, Dordrecht, pp. 380–397.
- von Stechow, Arnim (1984) "Comparing Semantic Theories of Comparatives," *Journal of Semantics* 3, pp. 1–77.
- von Stechow, Arnim (1990) "Focusing and Backgrounding Operators," in: Abraham, W. (ed.) *Discourse Particles, Pragmatics & Beyond*. John Benjamins, Amsterdam, pp. 37–84.
- von Stechow, Arnim (1991) "Current issues in the theory of focus," in: A. von Stechow & D. Wunderlich (eds.) *Semantik/Semantics: An International Handbook of Contemporary Research*. DeGruyter, pp. 804–825.

- von Stechow, Arnim (1996a) "Some remarks on choice functions and LF-movement," In: K. v. Heusinger & U. Egli (eds.) *Proceedings of the Konstanz Workshop "Reference and Anaphorical Relations"*, University of Konstanz.
- von Stechow, Arnim (1996b) "Against LF pied-piping," *Natural Language Semantics* 4, pp. 57–110.
- von Stechow, Arnim (1996c) "The Different Readings of Wieder 'Again': A Structural Account," *Journal of Semantics* 13(2), pp. 87–138.
- de Swart, Henriette (1996) "Meaning and use of *Not ... Until*," *Journal of Semantics* 13, pp. 221–263.
- de Swart, Henriette (2000) "Scope ambiguities with negative quantifiers," in: K. von Heusinger & U. Egli (eds.) *Reference and Anaphoric Relations*. Kluwer, Dordrecht, pp. 109–132.
- Szabolcsi, Anna (2002a) *Positive Polarity – Negative Polarity*. Ms., NYU.
- Szabolcsi, Anna (2002b) *Hungarian Disjunctions and Positive Polarity*. Ms., to appear in: Siptár, P. & I. Kenesei (eds.) *Approaches to Hungarian*.
- Takahashi, Daiko (1990) "Negative polarity, phrase structure and the ECP," *English Linguistics* 7, pp. 129–146.
- Tovena, Lucia M. (1993) *Exploring an algebraic semantic analysis of negative polarity*. Ms., University of Edinburgh.
- Tovena, Lucia M. (1996) *Studies on polarity sensitivity*, Ph.D. thesis, Univ. of Edinburgh.
- Tovena, Lucia M. (1998) *The fine structure of polarity items*. Garland Press, New York.
- Tovena, Lucia M. (2000) "Between mass and count," in: K. Megerdooimian & L.A. Bar-el (eds.) *WCCFL 20 Proceedings*. Somerville, MA: Cascadilla Press.
- Tovena, Lucia M. & Jacques Jayez (1997) "Any as a Finian quantifier," Proceedings of the 11<sup>th</sup> Amsterdam Colloquium, pp. 295–300.
- Uribe-Etxebarria, María (1994) *Interface Licensing Conditions on Negative Polarity Items: a Theory of Polarity and Tense Interactions*. Ph.D. thesis, Univ. of Connecticut.
- Vallduví, Enric (1990) *The informational component*. Ph.D. dissertaion, University of Pennsylvania, Philadelphia. Distributed by Garland, New York.
- Vallduví, Enric (1994) "Polarity items, n-words and minimizers in Catalan and Spanish," *Probus* 6, 263–294.
- Vendler, Zeno (1967) *Linguistics in Philosophy*. Cornell University Press, Ithaca.
- Vergnaud, Jean-Roger & Maria Luisa Zubizarreta (2000) "Phrasal stress and syntax," in: E. Anagnostopoulou & M. van Oostendorp (eds.) *Twenty Years of Grammatical Models*, the Netherlands: Royal Netherlands Academy of Arts and Sciences. Also to appear in: Everaert, M. & H. van Riemsdijk (eds.) *The Syntax Companion*, CD-Rom, Blackwell.
- Wagner, Michael (2005) "NPI-Licensing and Focus Movement." to appear in: Effi Georgala & Jonathan Howell (eds.) *Proceedings of SALT XV*. Cornell University.  
[<http://semanticsarchive.net/Archive/jAzYmYwY/wagner05salt.pdf>]
- Wilkinson, Karina (1993) "Towards a unified semantics of *even*: A reply to Rooth," in: *Semantics and Linguistic Theory (SALT) III*, Cornell University Press, Ithaca, pp. 182–201.
- Wilkinson, Karina (1996) "The scope of *even*," *Natural Language Semantics* 4, pp. 193–215.
- Williams, Edwin (1974) *Rule ordering in syntax*. Ph.D. dissertation, MIT.
- Williams, Edwin (1977) "Discourse and Logical Form," *Linguistic Inquiry* 8/1, 101–139.
- Williams, Edwin (1983) "Semantic vs. Syntactic Categories," *Linguistics and Philosophy* 6, 423–446.
- Williams, Edwin (1994) *Thematic Structure in Syntax*, The MIT Press, Cambridge, Massachusetts.
- Williams, Edwin (2003) *Representation Theory*, MIT Press, Cambridge, MA.

- Wiltschko, Martina (1994) *Einzig DPs*, Ms., Univ. of Vienna.
- Wiltschko, Martina (1997) 'Scrambling, D-linking and Superiority in German,' in W. Abraham (ed.) *Groninger Arbeiten zur Germanistischen Linguistik (GAGL) 41*, 107-142.
- Wold, Dag (1996) "Long Distance Selective Binding: The Case of Focus," *Proceedings of SALT 6*, Cornell University, Ithaca, NY, pp. 311–328.
- Wouden, Ton van der (1994a) *Negative contexts*. Ph.D. thesis, University of Groningen, Dissertations in Linguistics 12.
- Wouden, Ton van der (1994b) "Polarity and 'illogical negation'," in: Makoto Kanazawa & Christopher J. Piñón (eds.) *Dynamics, Polarity and Quantification*. CLSI, Lectures Notes.
- Wouden, Ton van der (1997) *Negative contexts: Collocation, Polarity, and Multiple Negation*. Routledge Studies in Germanic Linguistics 1, Routledge, London and New York.
- Wouden, Ton van der & Frans Zwarts (1993) "A Semantic Analysis of Negative Concord," *Proceedings of SALT 3*, Cornell University Press, Ithaca, pp. 202–219.
- Zamparelli, Roberto (1995) *Layers in the determiner phrase*. Ph.D. thesis, Univ. of Rochester, Rochester. (Published by Garland, 2000.)
- Zamparelli, Roberto (2004) *On singular existential quantifiers in Italian*. Ms., Univ. of Bergamo.
- Zanuttini, Raffaella (1989) *The Structure of Negative Clauses in Romance*, Ms., Univ. of Pennsylvania.
- Zanuttini, Raffaella (1990) *On the Relevance of Tense for Sentential Negation*, Ms., Univ. of Pennsylvania/Univ. of Geneva.
- Zanuttini, Raffaella (1991) *Syntactic Properties of Sentential Negation. A Comparative Study of Romance Languages*, Ph.D. Diss., Univ. of Pennsylvania, Philadelphia.
- Zubizarreta, Maria-Luisa (1998) *Topic, Focus and Word Order*. MIT Press, Cambridge, MA.
- Zwarts, Frans (1990) "The Syntax and Semantics of Negative Polarity," ms. for S. Busemann (ed.) (1993) *Views on the Syntax-Semantics Interface II*.
- Zwarts, Frans (1992) "Polarity items," in: R.E. Asher & J.M.Y. Simpson (eds.), *The encyclopedia of Language and Linguistics*. Pergamon Press, Oxford.
- Zwarts, Frans (1995) "Nonveridical contexts," *Linguistic Analysis* 25, pp. 286–312.
- Zwarts, Frans (1998) "Three Types of Polarity," in F. Hamm & E. Hinrichs (eds.) *Plural Quantification*. Kluwer, Dordrecht, pp. 286–312.