Volker Gast (Free University of Berlin)
gast@zedat.fu-berlin.de

Towards a semantic parameterization of focus quantifiers

1   Introduction: What are focus quantifiers?

In using the term 'focus quantifier' I refer to a *family of elements that express quantification over the domain of alternative values contrasting with the focus of a sentence*. The most typical representatives of this class are certainly focus particles like *only, too*, or *even* (cf. Horn 1969, 1992, 1996; Atlas 1991, 1996; König 1991, among many others). In addition to focus particles the notion 'focus quantifiers' encompasses other elements with a similar semantics, but with a different morphological make-up. For example, Finnish has two affixes *-kin* and *-kaan* that are basically equivalent to the English focus particles *too* and *either*, respectively. Relevant examples are given in (1). Like *also* and *too*, Finnish *-kin* and *-kaan* are 'focus quantifiers', but they are not 'focus particles'. I will refer to such elements as 'affixal focus quantifiers'.

(1) Finnish *-kin* 'too', *-kaan* 'either' (König 1991: 18)
   a. minä-*kin*   olen   hankkinut   auto-n.
      I-*too*   I.have   got   car-ACC
      'I, too, have got a car.'
   b. olen   hankkinut auto-n-*kin*
      I.have   got   car-ACC-*too*
      'I have got a CAR, too.'
   c. en   ole   hankkinut   auto-a-*kaan*
      NEG.1SG have   got   car-PART-*either*
      'I haven't got a CAR, either.'
   d. minä-*kään* en   ole   hankkinut auto-a
      I-*either*   NEG.1SG have   got   car-PART
      'Neither have I got a car.'

      The existence of affixal focus quantifiers is not a peculiarity of Finnish, and similar elements can be found in many other languages too. An example from Japanese is given in (2):

(2) Japanese *–mo* 'too' König (1991: 18)
   Taroo-*mo* sakana-o   tabemasu
   Taroo-*too* fish-ACC   eats
   'Taro, too, eats fish.'

      A third (morphological) type of focus quantifiers is represented by expressions like English *as well, let alone*, or *in particular*, by German *geschweige denn* ('let alone'), or Spanish *aunque sea* and *por lo menos* ('at least'). These expressions consist of two or more phonological words. It therefore seems appropriate to call them '*phrasal* focus quantifiers'. Finally, there is a fourth class of focus quantifiers that are, morphologically, discontinuous particle groups, like *mā ... ʔllā* in Arabic and *lo ... éla* in Hebrew ('not ... but'). These 'discontinuous focus quantifiers', as I call them, are used as translational equivalents of English *only*:

(3) Arabic *mā ... ʔillā* (Fischer & Jastrow 1996: 390)

   mā   yuḥibbu ʔillā   nafsahu
   NEG he.loves but   SELF.ACC.3SG
   'He loves only himself.'

(4) Hebrew *lo ... éla* (Glinert 1989: 251)

   hem lo   hisigu éla heskem   ḥelki
   they not reached but agreement partial
   'They only reached a partial agreement.'

As has been seen, focus quantifiers can be classified in terms of their morphological make-up along three dimensions. First, they are either LEXICAL (Engl. *only*) or AFFIXAL (Finnish *-kaan*); second, they are either SIMPLE or COMPLEX (*only* vs. *let alone*); and third, if they are complex, they are either CONTINUOUS or DISCONTINUOUS (Engl. *let alone* vs. Hebrew *lo ... éla*). Given the heterogeneous morphology of the expressions that are here subsumed under the label 'focus quantifiers', the question arises of whether all those expressions can be described in terms of the same semantic parameters. It is a major goal of this paper to show that this question can be answered positively. I will offer a framework of semantic classification for focus quantifiers, which will be characterized in terms of three semantic parameters: (i) the type of quantification expressed, (ii) the question of whether the relevant sets of alternatives are ordered or not, and (iii) the question of whether or not the quantificational statement made by a focus quantifier has the status of an assertion (Section 3).

Having established a framework for a lexico-semantic categorization of focus quantifiers, I will aim to show that there is a type of focus quantifier that expresses *negated universal quantification* over the set of focus alternatives. Hole (2004, to appear) has argued that such expressions exist in Mandarin Chinese (Sections 4), and I will try to show that English *at least,* in one of its uses, can be analyzed as an expression of this type too (Section 5). In Section 6, I extend my analysis of English *at least* to German *immerhin, zumindest* and *wenigstens*. It will be seen that a precise description of those items requires that the typology as presented in this paper should be extended and refined. As a first step, I will briefly introduce some basic concepts and terminology for the representation and interpretation of focus quantifiers in Section 2.

2   Representing the meaning of focus quantifiers

I will assume that sentences with focus quantifiers can generally be regarded as combinations of two components: first, there is a host sentence, which I will call PREJACENT, adopting a term that goes back to the Middle Ages and has been used, among others, by Kai von Fintel and Jay Atlas in the context of the focus particle *only*. And second, there is a quantificational statement which I will refer to as the ANNEX. Consider the example in (5):

(5) Only [JOHN]$_F$ attended the meeting.

The PREJACENT of (5) is the 'host sentence' [*John*]$_F$ *attended the meeting.* The ANNEX is the quantificational contribution made by the focus quantifier, in this case: 'No one other than John attended the meeting'. In order to 'extract' the prejacent from a sentence containing a focus quantifier, I will use a function $\lambda\alpha[\text{PJ}(\alpha)]$, which maps such sentences onto their prejacents by 'removing' the focus quantifier. For example, the function $\lambda\alpha[\text{PJ}(\alpha)]$, applied to (5), delivers [*John*]$_F$ *attended the meeting.* This is illustrated in (6). Note that the mapping from sentences with focus quantifiers to their prejacents preserves focus marking.

(6) PJ(5) = [John]$_F$ attended the meeting.

The notions 'prejacent' and 'annex' do not entail anything as to the discourse pragmatic status of the relevant components. We will see below that both the annex and the prejacent may be either presupposed or asserted.

We can now turn to the semantic representation of the meaning of focus quantifiers. I will use Rooth's (1985, 1992, 1996) framework of 'two-dimensional' semantics. Rooth distinguishes between two interpretation functions: first, there is the 'ordinary semantic value' of a sentence, which is basically equivalent to the common interpretation function in a model-theoretic semantics. It is a proposition (= set of worlds). And second, there is an additional interpretation function, which Rooth calls the 'focus semantic value'. Applied to a sentence α, the focus semantic value delivers a set of propositions that differ from the ordinary semantic value of α only in that the focus is replaced with some contextually salient alternative value that is of the same semantic type. The ordinary semantic value of α is also contained in the focus semantic value. Rooth calls such sets 'p-sets'. P-sets are inspired by Jackendoff's 'presups', so the 'p' is associated with the notion 'presupposition' (not 'proposition'!).

Both interpretation functions are symbolized using the common double brackets, and they are differentiated by superscripts: the ordinary semantic value is marked with a superscript 'o', while the focus semantic value bears a superscript 'f'. This is shown in (7).

(7) a. $[[\alpha]]^o$: ordinary semantic value ($\equiv$ the common interpretation function)
   b. $[[\alpha]]^f$: focus semantic value (the set of propositions that differ from $[[\alpha]]^o$ in that the focus is replaced with some contextually salient alternative plus $[[\alpha]]^o$); p-sets

The relevance of the two functions can be illustrated using example (5): (8) gives the p-set of the prejacent of (5), and (9) provides the ordinary interpretation function, applied to the prejacent of (5). The single quotation marks enclosing the elements of $[[\text{PJ}(5)]]^f$ indicate that those elements are propositions (sets of worlds), not sentences (linguistic objects).

(8) $[[\text{PJ}(5)]]^f$ = {'John attended the meeting', 'Fred attended the meeting' ...}
(9) $[[\text{PJ}(5)]]^o$ = {w | John attended the meeting in w}

P-sets like the one shown in (8) can be used to describe the meaning of *only*-sentences. The interpretation of (5) is given in (10). The extension of (5) is regarded as a subset of the extension of its prejacent: it is the set of worlds w such that there is no proposition π from the p-set of the prejacent of (5) such that π is not the ordinary semantic value of the prejacent of (5), and w is in π.

(10) $[[(5)]]^o$ = {w $\in$ $[[\text{PJ}(5)]]^o$ | $\neg\exists\pi \in [[\text{PJ}(5)]]^f$: $\pi \neq [[\text{PJ}(5)]]^o \wedge$ w $\in \pi$}

In order to avoid clumsy formulas like the one in (10), I will define an additional interpretation function which I call the 'focus complement'. The focus complement is the complement of the ordinary semantic value, relative to the focus semantic value. It is represented by a superscript 'fc' on the double brackets symbolizing the interpretation function. A definition of the focus complement is given in (11). For the sake of simplicity, we can now represent the annex ($\equiv$ quantificational statement) of (5) as shown in (12).

(11) $[[\alpha]]^{fc} := [[\alpha]]^f \backslash [[\alpha]]^o$ $\quad\quad\quad\quad\quad$ (= {π | $\pi \in [[\alpha]]^f \wedge \pi \neq [[\alpha]]^o$})
(12) $\neg\exists\pi \in [[\text{PJ}(5)]]^{fc}$: π is true

3 Parameters of semantic classification

3.1 Exclusive vs. additive focus quantifiers

Having established some basic terminology, we can now proceed to consider the semantic parameters that we need to describe the meaning of focus quantifiers. The first parameter concerns the type of quantification expressed. There is a traditional distinction between *exclusive* and *additive* focus particles (made, among others, by König 1991), which can be

applied to other morphological types of focus quantifiers too. In the case of exclusive focus quantifiers, no proposition from the set of alternatives is true, i.e. these particles express NEGATED EXISTENTIAL QUANTIFICATION over the domain of alternative values. This is what is represented in (10) and (12) above. Additive particles, by contrast, indicate that *some* proposition from the set of alternative propositions *is* true; in other words, they express EXISTENTIAL QUANTIFICATION over the domain of alternative values. This is shown in (13):

(13) John attended the meeting, too.
       $\exists \pi \in [[\text{PJ}(13)]]^{fc} : \pi$ is true

The distinction between exclusive and additive focus quantifiers will be captured by a binary feature which has either the value [∃] or the value [¬∃]. Below it will be argued that this distinction is not sufficient to capture the possible meanings expressed by focus quantifiers, and I will propose that universal and negated universal quantification are also possible parameter settings (Section 4).

3.2   Assertive vs. non-assertive focus quantifiers

Obviously, the type of quantification expressed is not the only difference between *only* and *too*. The relevant sentences also differ in terms of the discourse pragmatic status of their meaning components (prejacent and annex). This brings us to the second parameter of classification. In *only*-sentences, the ANNEX is asserted, while the prejacent is presupposed, at least if we follow Horn (1992, 1996). I will operate with a semantic notion of presupposition: a proposition π is taken to presuppose another proposition ρ iff both π and ¬ π entail ρ. Under this definition, (14) presupposes its prejacent, since both (14) and (15) seem to entail that John attended the meeting (*pace* Horn and contra Atlas).

(14) Only John attended the meeting.
       a.   pres.:   John attended the meeting (PREJACENT)
       b.   ass.: $\neg \exists \pi \in [[\text{PJ}(14)]]^{fc} : \pi$ is true (ANNEX)

(15) It is not true that only John attended the meeting.
       a.   pres.:   John attended the meeting.
       b.   ass.: $\neg[\neg\exists\pi \in [[\text{PJ}(14)]]^{fc} : \pi$ is true] $(\equiv \exists\pi \in [[\text{PJ}(14)]]^{fc} : \pi$ is true$)$

The information structural status of the annex and prejacent is clearly different in sentences with *too*. This is shown in (16) and (17). Here, it is the annex that is entailed by both sentences, while the prejacent is implied by (16), but not by (17).

(16) John attended the meeting, too.
       a.   pres.: $\exists\pi \in [[\text{PJ}(16)]]^{fc} : \pi$ is true
       b.   ass.:   John attended the meeting.

(17) It is not true that John attended the meeting, too.
       a.   pres.: $\exists\pi \in [[\text{PJ}(16)]]^{fc} : \pi$ is true
       b.   ass.:   John did not attend the meeting.

As the examples given above show, there are two ways how 'meaning components' (prejacent and annex) can be mapped onto 'information structural components' (presupposition and assertion). In *only*-sentences, the prejacent is presupposed, while the annex is asserted; in *too*-sentences, it is the prejacent that is asserted, while the annex is presupposed. (18) and (19) are therefore similar in meaning, but appropriate in different discourse environments:

(18) John attended the meeting, too.   (pres.: $\exists\pi \in [[\text{PJ}(16)]]^{fc} : \pi$ is true)
(19) Not only John attended the meeting.   (pres.: John attended the meeting.)

The parameter of variation described in this section will be captured by a feature [± ASSERTIVE]. If the annex is asserted (cf. *only*), the relevant focus quantifier will be specified as [+ ASSERTIVE]; if the annex is presupposed, the focus quantifier will be [− ASSERTIVE]. This distinction is summarized in Table 1.

	ASSERTIVE	NON-ASSERTIVE
PREJACENT	presupposed	asserted
ANNEX	asserted	presupposed
example	*only*	*too*

Table 1: Assertive and non-assertive focus quantifiers

3.3 Scalar vs. non-scalar focus quantifiers

The third important parameter of classification concerns the sets of alternatives under discussion, i.e. the sets over which a focus quantifier quantifies. These sets may be either ordered or unordered. Accordingly, we can distinguish between 'scalar' and 'non-scalar' focus quantifiers. Obviously, this aspect of interpretation relates to properties of contexts, but given that focus quantifiers impose compatibility requirements on their environments, it is clearly necessary to regard this parameter as pertaining to the semantics of focus quantifiers proper. Scales are sometimes assumed to be presupposed or conventionally implicated. I would not like to take a stance in this question, but it seems to me that scalar contexts are a prerequisite, rather than a consequence, of the use of scalar focus quantifier, so the most appropriate way of dealing with this question is probably to regard the requirement of scalar contexts as a kind of selectional restriction.

The difference between scalar and non-scalar focus quantifiers can be illustrated using the contrast between *even* and *too*: both of the two particles are additive, but only *even* requires a scale to interact with. Relevant examples are given in (20) and (21).

(20)   The chancellor was there, too.
(21)   Even the chancellor was there.

(20) (merely) requires that some proposition π from the p-set of (20) as listed in (22) be true, where $\pi \neq [[(20)]]^o$. (21) necessitates a context in which the set of alternatives is ordered by the relation 'x is less likely than y', as shown in (23). The prejacent of the *even*-sentence occupies the highest rank on this scale.

(22) $[[\text{PJ}(20)]]^f =$ {The chancellor was there, The secretary was there, The vice-chancellor was there ...}
(23) $[[\text{PJ}(21)]]^f =$ <The secretary was there, The vice-chancellor was there, The chancellor was there>

There are, of course, various types of scales, or various types of relations ordering sets of alternatives. The question of how those scales can be defined has been among the most difficult and, at the same time, most neglected issues in focus semantics. Jacobs (1983), Löbner (1990) and Hole (2004) are among the very few references where some relevant discussion can be found. I will assume that there are two basic types of scales. First, there is the (semantic) scale of informativeness, which is ordered by the entailment relation; and second there are 'speaker-evaluative' scales, i.e. scales in which speakers express an attitude towards a given state of affairs. This attitude may relate to ontological questions like PROBABILITY, to epistemic categories like EVIDENTIALITY, or to sociological or ethical categories like DESIRABILITY. I take it that speaker-evaluative scales are related via metonymy to the more basic scale of informativeness. For example, a scale of probability (with which *even* interacts) can be metonymically related to scales of informativeness because stronger

propositions are typically (though not necessarily) less likely than weaker propositions. Scales of 'desirability' and 'epistemic commitment' will be of special interest below.

The 'selectional restrictions' imposed by a focus quantifier on the context will be captured as follows: There is a binary parameter [± SCALAR]. Those focus quantifiers that are [+ SCALAR] are either [+ INFORM] (when they are ordered by the entailment relation), or [− INFORM] (when they are speaker-evaluative). The class [− INFORM] can further be specified in terms of a (probably infinite) set of categories of speaker-evaluation Figure 3 provides a tree diagram illustrating this parameter of classification.
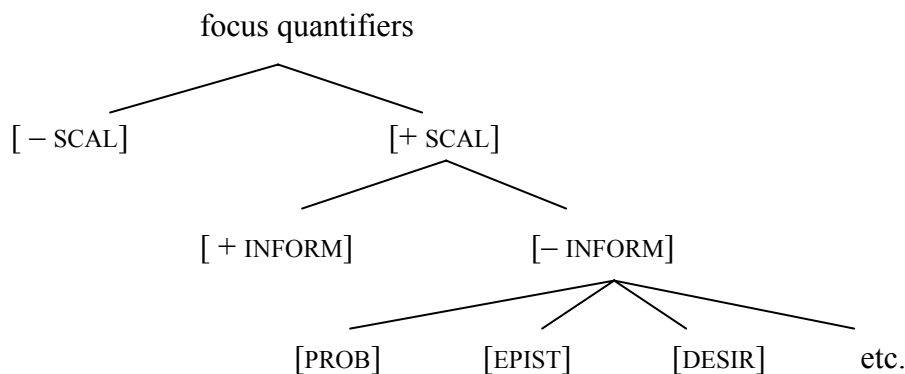

Figure 3: Scalar and non-scalar focus quantifiers

3.4 Preliminary summary

Let us briefly summarize the suppositions and hypotheses made so far. I have established three parameters of classification that can be used to characterize and classify focus quantifiers: First, focus quantifiers indicate either existential or negated existential quantification (*too* vs. *only*). Second, they are either assertive (*only*) or non-assertive (*too*). And third, they are either scalar (*even*) or non-scalar (*too*), with several sub-classes of the first group. These parameters can now be used to represent the meaning of the focus quantifiers discussed above as shown in (24). As can be seen, I allow underspecification of parameters. *Only* is categorized as [± SCAL] because it may interact with both scalar and non-scalar contexts.

(24)		QUANT	SCAL	ASS
	only	[¬∃]	[± SCAL]	[+ ASS]
	too	[∃]	[− SCAL]	[− ASS]
	even	[∃]	[+ SCAL [− INFORM [PROB]]]	[− ASS]

4 An extension: Negated universal focus quantification in Mandarin Chinese

Thus far, I have summarized and systematized common knowledge about the meaning of focus quantifiers. In what follows I will present an extension of this typology, which has been inspired by work done by Daniel Hole. Hole (2004, to appear) has argued that Mandarin Chinese encodes all types of focus quantification from the square of opposition.[1] There is an element *cái* that is associated with negated existential quantification over the domain of alternative values (like English *only*), and there is a particle *yě* that is used in the context of existential quantification (like English *too*). In addition to those, there are two operators that are used when universal or negated universal focus quantification is expressed: *dōu* for universal quantification (roughly, 'even'), and *jiù* for negated universal quantification. This last element *jiù* is what I am most interested in. For a felicitous use of *jiù* it is crucial that not

---

[1] It should be noted, however, that the relevant operators are not themselves focus quantifiers, but reflexes of specific types of focus quantification. Hole operates with the notion of 'focus-background agreement'.

all alternatives from the p-set be true. The examples given in (25) and (26) illustrate the use of this item. *Jiù* cannot be used if all contrasting propositions are true, as in (26), which is consequently infelicitous.

(25) Oūzhōu rén   dāng zhōng,   Ìdàlì   rén   jiù   zhǎng-zhe   hēi   tóufa.
      Europe people among   Italy   people *jiù* grow-ASP   black hair
      ,Among Europeans, Italians (*jiù*) have black hair.'

(26) #Dōng-Yā rén   dāng zhōng, Rìběn   rén   jiù   zhǎng-zhe hēi   tóufa.
      East-Asia people among   Japanese people *jiù* grow-ASP black hair
      ,Among the people from East Asia, the Japanese (*jiù*) have black hair.'
      Hole (2004: 8)

Among the alternative propositions contrasting with (25) there are sentence meanings like 'Swedes have black hair', which is not (generally) true. *Jiù* is thus licensed. For (26), we get contrasting propositions like 'The Chinese have black hair' and 'The Korean have black hair', which are all (generally) true. This is why *jiù* cannot be used here. In the following I will aim to show that English and German have lexical items with a restriction similar to that of Mandarin *jiù*. In other words, I will make an argument to the effect that there are 'negated universal focus quantifiers' in English and German. As a consequence, the typology developed above can be extended, insofar as we can assume two more parameter settings for the type of quantification expressed.

5   *At least* as a negated universal focus quantifier

The first 'negated universal focus quantifier' that I will discuss is English *at least*. In a very clear paper, Kay (1992) distinguishes between three syntactically different uses of *at least*, which are illustrated in (27) – (29). Kay calls these uses 'scalar', 'evaluative' and 'rhetorical'.

(27) Mary received calls from [[at least three] soldiers].   ('scalar')
(28) At least [this one's cooked].   ('evaluative')
(29) I see her every day, at least [when I'm in town].   ('rhetorical')

'Scalar' *at least* is typically in construction with some quantifier and cancels the upper bounding scalar implicature usually associated with quantifying propositions. Kay speaks of 'implicature suspension'. It can also be used in combination with propositions that do not contain any obviously quantifying component, as the sentence in (30). In this use, which will not concern us any further, *at least* stands in a relation of antonymy to *at most*. Syntactically, 'scalar' *at least* is either a left sister of its focus with no special intonation marking, or it occurs somewhere to the right of the focus, with parenthetical intonation (cf. Kay 1992). It is also important to note that 'scalar' *at least* cannot occur at a distance from its focus, and that it always combines with maximal projections, since this distinguishes it from the other use types to be considered below. I do not consider scalar *at least* to be a focus quantifier. It is a function from quantifiers to quantifiers.

(30) That's going to at least worry him if not make him utterly distraught. (Kay 1992: 311)

'Evaluative' *at least* indicates, in Kay's words, a "positive evaluation" and "a less than maximal degree ... hence, putting these two together, [...] a less than maximal degree of positive evaluation" (Kay 1992: 315). Kay also refers to this fact as an aspect of 'non-maximality'. As has been mentioned, the two use types of *at least* considered so far can be differentiated syntactically. This is illustrated by the minimal pair given in (31) and (32). While (31) is ambiguous, (32) allows only the evaluative reading, since 'scalar' *at least* cannot be distant from its focus.

(31) In that big trainwreck at least several people were saved. (ambiguous)

(32) At least in that big trainwreck several people were saved. (evaluative)

Finally, 'rhetorical' *at least* is closely related to 'evaluative' *at least* and represents a systematic metonymical extension of it. We will return to this point later. For a start, I will aim to show how Kay's 'evaluative' *at least* can be described in the framework outlined above. My claim is that 'evaluative' *at least* is a focus quantifier with the features given in (33): It expresses negated universal quantification (like Mand. *jiù*), it requires speaker-evaluative scales of 'desirability', and it is non-assertive (like Engl. *too*).

(33) 'evaluative' *at least*: $[\neg\forall]$ $[+ \text{SCAL} [- \text{INFORM} [\text{DESIR}]]]$ $[- \text{ASS}]$

Let us consider these claims in turn. First, I should justify the very claim that *at least* is a focus quantifier. This assumption entails (a) that it is cross-categorial, and (b) that it interacts with foci. The examples in (34) – (38) may serve to illustrate that these requirements are met.

(34) At least the OLD woman tried to help me (though the YOUNG woman didn't).
(35) At least the old WOman tried to help me (though the old MAN didn't).
(36) At least the old woman TRIED to help me (though she didn't SUCCEED).
(37) At least the old woman tried to HELP me (though she didn't offer to DO IT IN MY STEAD).
(38) At least the old woman tried to help ME (though she didn't help YOU).

Let us now turn to my assumptions concerning the feature specification of *at least*, starting with the type of quantification expressed. According to my analysis, *at least* is appropriate in a context in which it is presupposed that 'not all propositions from the p-set (or focus complement) of the relevant prejacent are true'. Consider (39) for illustration. In (40) the presupposition of 'non-maximality' is explicitly mentioned in the context (note that presuppositions can generally precede the associated sentences without giving rise to infelicity).

(39) At least in that conference [the CHAIRman]$_F$ was sober.
(40) Not all participants were sober, but at least [the CHAIRman]$_F$ wasn't drunk.

The p-set associated with (the prejacent of) (39) is a scale ordered by the relation 'x is less desirable than y', from the speaker's perspective. It has the form given in (41).[2]

(41) $[[\text{PJ}(39)]]^f =$ <Very few participants were sober, some participants were sober, most participants were sober, all participants were sober>

In a next step, it needs to be shown that (39) would be infelicitous in a situation in which all propositions in $[[\text{PJ}(39)]]^f$ would be true. This would be the case if the strongest proposition were true, viz. *All participants were sober*. It can easily be shown that 'evaluative' *at least* is inappropriate in such a context (cf. (42)). Note that the sentence becomes much better if we use *most but not all* instead of *all* (cf. (43)), although in that case we would probably add some concessive connective like *still* or *after all*.

(42) #All participants were sober, and at least [the CHAIRman]$_F$ was sober (, too).
(43) Most but not all participants were sober; but at least [the CHAIRman]$_F$ wasn't drunk.

In order to understand the relevance of the (presuppositional) quantification associated with *at least*, it is instructive to compare such sentences to the relevant counterparts containing either *too* or *even*, whose annex is likewise presuppositional. The parallelism

---

[2] I assume that it is presupposed that at least one participant was sober, since a sentence with a focal quantifier would be appropriate as an answer to the question *How many participants were sober?* The answer *No one was sober* would, accordingly, require accommodation. To be fully explicit the speaker would first have to ask *Was anyone sober?*

between (44) and (45) shows that the most important aspect of meaning distinguishing *at least* from *too* and *even* is the type of quantification expressed.

(44) a. Some participants were sober; the chairman was sober, too.
      b. Some participants were sober; even the invited speaker was sober.
(45) Not all participants were sober, but at least the chairman was sober.

According to the analysis put forward above, (39) can be interpreted as shown in (46):

(46) (a) presupposed: $\neg \forall \pi \in [[\text{PJ}(39)]]^{f} : \pi$ is true
      (b) asserted: The chairman was sober.

My second parameter setting specifies *at least* as requiring scales that are ordered by the relation 'x is less desirable than y' (cf. (41)). This point is illustrated in (47) and (48) (from Kay 1992).

(47) At least in that big trainwreck several people were saved.
(48) ##At least in that big trainwreck several people were killed.

Let us now come back to Kay's 'rhetorical' *at least*. In a more recent publication, Diana Lewis, drawing on Kay, states the following: "Rhetorical Retreat *at least* [Kay's 'rhetorical' *at least*, VG] revises an idea: (i) with an alternative idea [(49)], (ii) by restricting its domain of applicability [(50)], or (iii) by reducing epistemic commitment to it [(51)]" (Lewis 2002: 527).

(49) ...a present or at least an agent.
(50) we have not, in Britain *at least* valued it at its truth worth.
(51) –It's ...it's not in this week then ... that one? –No it doesn't seem to be ... *at least* I ... I didn't see it (Lewis 2002: 527)

I would like to argue that (49) can be regarded as instantiating either 'scalar' or 'evaluative' *at least* (depending on the wider context; Lewis 2002 does not provide more information), and that (50) and (51) can be subsumed under a single 'rhetorical' meaning or function. Like 'evaluative' *at least*, 'rhetorical' *at least* is a negated universal focus quantifier, but it relates to different types of scales, namely to scales of 'epistemic commitment'. The relevant propositions are not ordered according to their own propositional content, but according to an implicit (superordinate) epistemic predicate. Consider the examples in (52), which are taken from Kay (1992: 318).

(52) a. Mary is at home, at least John's car is in the driveway.
      b. Mary is at home, at least I think so.
      c. Mary is at home, at least that's what Sue said. (Kay 1992: 318)

The linguistic entities contrasting with *Mary is at home* in (52) are not alternative *propositions*, but alternative *types of utterances* with a different illocutionary force, in particular with regard to the category of evidentiality. Some examples with different degrees of epistemic commitment, but with the same propositional content, are given in (53). If we paraphrase the examples in (52) in the way illustrated in (53), this allows us to form ordered sets of alternatives like those in (54).

(53) a. I know for sure that Mary is at home
      b. I think that Mary is at home because someone told me...
      c. I infer that Mary is at home because of some piece of evidence...
(54) a. <I infer that Mary is at home (because John's car is in the driveway), I know that Mary is at home>
      b. <I think that Mary is at home, I know that Mary is at home>
      c. <I believe that Mary is at home because Sue told me, I know that Mary is at home>

'Rhetorical' *at least* expresses negated universal quantification over sets of alternatives like those given in (54). The strongest statement, or the strongest type of evidentiality, is excluded, but a weaker statement is made. This triggers a 'relativizing effect': the speaker does not want to commit himself/herself to a maximal degree of epistemic evidentiality, but still makes the strongest statement possible. The feature specification of 'rhetorical' *at least* is given in (55).

(55) 'rhetorical' *at least*:   [¬∀]   [+ SCAL [− INFORM [EPIST]]]   [− ASS]

6   Negated universal focus quantifiers in German: *wenigstens, immerhin, zumindest*

We can now turn to German, which has a richer inventory of negated universal focus quantifiers than English. There are at least three elements to which this term can be applied. They all translate *at least* into English, and they are listed in (56).

(56) negated universal focus quantifiers of German:
      wenigstens, immerhin, zumindest

  Wenigstens is basically equivalent to English *at least*, and it can be described using the same feature specification ([¬∀], [+ SCAL [− INFORM [DESIR]]], [−ASS]). A German sentence paraphrasing (47) above is given in (57).

(57) Wenigstens   konnten bei   diesem   Zugunglück   [EInige]$_F$ Leute
      at least   could   in   this   trainwreck   some   people
      gerettet   werden
      saved   be
      'At least in that trainwreck SOME people could be saved.'

  Immerhin and *zumindest* have a very similar meaning, but they are more general insofar as they are not (necessarily) linked to scales of desirability. Like English *at least*, *wenigstens* cannot be used with negatively evaluated states of affairs like the one in (58). *Immerhin* and *zumindest*, by contrast, are neutral with regard to evaluation and *can* therefore be used in such contexts. This is shown in (59).

(58) ##Wenigstens wurden bei   diesem   großen Zugunglück viele   Leute   getötet.
          at least   were   in   this   big   trainwreck many   people killed
      '##At least in that big trainwreck several people were killed.'
(59) [You shouldn't say that the accident was no big deal.]
      a. Immerhin wurden bei diesem großen Zugunglück viele Leute getötet.
      b. Zumindest wurden bei diesem großen Zugunglück viele Leute getötet.

  Like (57), both sentences in (59) presuppose that not all of the people were killed. The discourse sequence in (60) is therefore completely natural, while the one in (61) is infelicitous, to say the very least.

(60) Es   wurden nicht alle Leute getötet, aber immerhin starb   der Zugführer.
      EXPL were   not   all people killed, but   IMMERHIN died   the conductor
      'Not all people were killed, but at least the conductor died.'
(61) #Alle Leute wurden getötet, und   immerhin starb (auch) der   Zugführer
       all   people were   killed and   IMMERHIN died also   the   conductor
      'All people were killed, and at least the conductor died.'

  The distinction between *wenigstens* on the one hand and *zumindest* and *immerhin* on the other can be captured in the specification of the [SCAL] feature. While *wenigstens* has the feature [+ SCAL [− INFORM [DESIR]]], *zumindest* and *immerhin* are more general, since they are only [+ SCAL] (which permits [+ SCAL [− INFORM [DESIR]]] as a special case).

The question arises in how far *zumindest* and *immerhin* differ from each other. Intuitively, there is certainly a difference between (59)a. and (59)b. While in (59)a. the speaker seems to make a point that the hearer is underestimating the situation, (59)b. has a relativizing overtone. Moreover, there is a clear contrast between *zumindest* and *immerhin* as far as possible alternative readings are concerned: Only *zumindest* has a 'scalar' *use* (*zumindest/*immerhin fünf Leute* 'at least five people'), and only *zumindest* has a 'rhetorical' reading analogous to that of *at least.* This is illustrated in (62) and (63).

(62) Es sind nicht alle   gestorben – wenigstens/zumindest glaube ich das.
      it are   not all   died   at least   believe I   that
      'Not all people have died – at least I think so.'
(63) ??Es sind nicht alle gestorben – immerhin glaube ich das.

In order to capture the subtle semantic differences between *zumindest* and *immerhin* we would probably have to make additional distinctions within the [SCAL]-parameter. For example, we could add an aspect of 'expectation' to modify the scales: while *immerhin* seems to indicate that the prejacent exceeds the speaker's expectations, *zumindest* indicates a certain 'upward potential', i.e. things might have turned out worse. Weydt (1979a, 1979b) has pointed out that *zumindest* seems to admit that the strongest proposition under discussion *might* be true, whereas *zumindest* positively excludes this possibility, but this observation may be related to the fact that *wenigstens*, but not *immerhin*, has a 'scalar' use. Still, it is possible that *wenigstens* is associated with a 'weaker' presupposition than *zumindest,* maybe with a 'focus supposition' in the sense of Büring (to appear). In that case, we would have to assume additional sub-classes within the group of non-assertive focus quantifiers. To spell out such fine-grained distinctions is certainly an interesting task of its own.

7   Conclusions and outlook

I hope to have illustrated that a semantic parameterization of focus quantifiers is a fruitful approach both to the description of such elements in individual languages, and for cross-linguistic comparison. Moreover, I hope to have illustrated that the consideration of other languages like Mandarin Chinese often provides inspiration even for the analysis of particular languages like English and German. Also, such an approach compels us to be explicit about the categories and parameters that we use to describe and classify the relevant expressions. However, it has probably become clear that there are a number of open questions and problems too. Among the most central issues are certainly the following: How can we define scales or types of scales that are associated with a given focus quantifier? And how can these scales be related to one another, for example via metonymy? What types of presuppositions are associated with focus quantifiers? Are these presuppositions really in all cases semantic in nature, or are they sometimes subject to a weaker condition like Schwarzschild's (1999) GIVENness? Are there different types of focus quantifiers, depending on the type of presupposition/focus supposition that they trigger? The present (programmatic) paper is meant to be only a first step towards a more comprehensive lexico-semantic characterization of elements like those described above.

References

Atlas, J. D. (1991). Topic/comment, presupposition, logical form and focus stress implicatures: the case of focus particles *only* and *also*. *Journal of Semantics* 8: 127–47.

Atlas, J. D. (1996). *Only*, quantifiers, NPIs, and monotonicity. *Journal of Semantics* 13: 265–328.

Büring, D. (to appear). Focus suppositions. *Theoretical Linguistics*.

Glinert, L. (1989). *The Grammar of Modern Hebrew*. Cambridge: Cambridge University Press.

Hole, D. (2004) *Focus and background marking in Mandarin Chinese. System and theory behind cái, jiù, dōu and yě*. (Asian Linguistics 5.) London & New York: RoutledgeCurzon.

Hole, D. (to appear). 'Mapping backgrounds and modal restrictors to VP: Anti-Diesing effects in Mandarin Chinese'. to appear in: Klaus von Heusinger, Ken P. Turner (eds.). *Where Semantics Meets Pragmatics*. Elsevier.

Horn, L. (1969). A presuppositional analysis of *only* and *even. CLS*, 5: 98–107.

Horn, L. (1992). The said and the unsaid. In *Proceedings of the Second Conference on Semantics and Linguistic Theory*, 163–92.

Horn, L. (1996). Exclusive company: only and the dynamics of vertical inference. *Journal of Semantics*, 13: 11–40.

Jacobs, J. (1983). *Fokus und Skalen. Zur Syntax und Semantik von Gradpartikeln*. Tübingen: Niemeyer.

Kay, P. (1992). 'At least'. In Lehrer, A. & E.F. Kittay (eds.), *Frames, Fields, and Contrasts – New Essays in Semantic and Lexical Organization*, 309-31. Hillsdayle, NJ: Lawrence Erlbaum Associates.

König, E. (1991). *The Meaning of Focus Particles. A Comparative Perspective*. London: Routledge.

Lewis, D.M. (2002). 'Rhetorical factors in lexical-semantic change: the case of *at least*'. In Díaz Vera, J. (ed.), *A Changing of Words – Studies in English Historical Lexicography, Lexicology and Semantics*. Amsterdam & New York: Rodopi, 525-38.

Löbner, S. (1990). *Wahr neben Falsch – Duale Operatoren als die Quantoren natürlicher Sprache*. Tübingen: Niemeyer.

Rooth, M. (1985). *Association with Focus*. PhD thesis, University of Massachusetts at Amherst.

Rooth, M. (1992). 'A theory of focus interpretation'. *Natural Language Semantics* 1: 75-116.

Rooth, M. (1996). 'Focus'. in Lappin, S. (ed.), *The Handbook of Contemporary Semantic Theory*. London: Blackwell, 271-97.

Schwarzschild, R. (1999). 'GIVENness, AvoidF and other constraints on the placement of accent'. *Natural Language Semantics* 1.1: 75-116.

Weydt, H. (1979a). ‚Immerhin'. In Weydt (ed.), 335-48.

Weydt, H. (1979b). ‚Partikelanalyse und Wortfeldmethode: *doch, immerhin, jedenfalls, schließlich, wenigstens'*. In Weydt (ed.), 395-413.

Weydt, H. (ed.) (1979). *Die Partikeln der deutschen Sprache*. Berlin: de Gruyter.