Focus marking and focus interpretation

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ABSTRACT

The languages of the world exhibit a range of formal phenomena (e.g. accenting, syntactic reordering and morphological marking) that are commonly linked to the information-structural notion of *focus*. Crucially, there does not seem to be a one-to-one mapping between particular formal features (focus marking devices) and focus, neither from a cross-linguistic perspective, nor within individual languages. This raises the question of what is actually being expressed if we say that a constituent is focused in a particular language, and whether, or to what extent, the same semantic or pragmatic content is formally expressed by focus-marking across languages. This special issue addresses the question of focus and its grammatical realization from a number of theoretical and empirical perspectives.

In this introductory article we elaborate on this question by making an explicit proposal about what we take to be the correct way of thinking about the information-structural category of focus and its formal realization. In the first part, we introduce a unified semantico-pragmatic perspective on focus in terms of alternatives and possible worlds. In the second part, we present a cursory cross-linguistic overview of focus marking strategies as found in the languages of the world. Finally, in the third part, we discuss the connection between the notion of focus, different pragmatic uses of focus and different focus marking strategies employed in the grammars of natural languages.

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1. The characterization of focus

1.1. Focus and information structure

We take focus to be a universal category of *information structure*. From a communication-oriented perspective, information structure can be understood as belonging to the dimension of *common ground-management*, as opposed to *common ground-content* (Chafe, 1976; Krifka, 2008; Féry and Krifka, 2008). The *common ground* is here understood in the spirit of Stalnaker (1973, 1974, 2002), i.e., as the mutually shared knowledge of the interlocutors in a discourse. *Common ground management* introduces an additional dimension of meaning that relates to the aims, to the internal structure and to the future development of the discourse. One way of thinking about common ground management is in terms of discourse development that is driven by hierarchies of open questions in need to be settled (Roberts, 1996).

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Information structure in this sense is not primarily concerned with the actual information content of an utterance, but rather with the ways in which this information is integrated into the common ground. Hence, whenever information structure appears to have a direct impact on the information conveyed, such as, for example, with instances of focus-sensitive expressions, this will constitute an explanandum for semantic and pragmatic theory.

Another way of thinking about information structure is by adopting a more cognitive perspective. From this perspective, the central function of information structure lies in the optimization of the processing of information coded in a linguistic utterance in light of the specific discourse needs of the interlocutors at the time of utterance. In the case of focus, for instance, such information updating is aided by providing a set of alternatives for an asserted utterance. This set of focus alternatives serves as a preliminary evaluation context, for example, by relating the utterance containing the focused constituent to a particular relevant question in need of resolution at the current state of discourse. This task is intimately tied to a number of other cognitive faculties, such as, for instance, attention and short term memory. For this reason, it seems appropriate to think of information structure as belonging to the domain of central general-purpose cognitive processes in Fodor's (1983:112) classification, rather than to the specialized linguistic systems with their central function of input analysis. Information structure is hence best thought of as a cognitive domain mediating between the linguistic core modules, such as syntax, phonology, and morphology, and other cognitive faculties serving the central purpose of communication by way of pragmatic reasoning and general inference processes (Zimmermann and Féry, 2010).

Finally, assuming that the cognitive tasks employed in the organization and updating of the common ground and the cognitive faculties involved at this very basic level of processing are by and large the same across languages and cultures, we take information structure and the category of focus, but *not* its structural coding, to be universals.

1.2. Focus and alternatives

Most semanticists will agree on the basic intuition that focus relates an utterance to a set of relevant alternatives (Rooth, 1985, 1992, 1996; von Stechow, 1991; Krifka, 2001, 2006, 2008). In the words of Krifka (2008), focus 'indicates the presence of alternatives' that are relevant for the interpretation of a given linguistic expression. Consider, for example, the English sentence in (1), in which the focus status of the subject is overtly indicated by the falling nuclear pitch accent on the subject (marked by 'CAP\').

(1)   PE\ter went to Paris.

Intuitively, focus marking on the subject in (1) indicates that alternative propositions of the form *x went to Paris* are relevant for the interpretation of (1): for instance, (1) would constitute an ideal answer to the *wh*-question *Who went to Paris?* (Roberts, 1996; Büring, 2003; Beaver and Clark, 2008), or it could also be used in order to contradict and correct a preceding assertion, such as *John went to Paris.*

More needs to be said about the presence of alternatives, though, and about the specific role they play in the interpretation of utterances. In what sense, and at which level, are focus alternatives present in *a privileged way*, and in what sense are they relevant for interpretation?

We assume that the central function of focus is not unlike that of modals: Similar to modal expressions (Kratzer, 1991a), focus imposes an ordering relation on the overall set of possible worlds that serve as the general background for interpretation, such that a subset of worlds is identified as being relatively more important for the interpretation of a given utterance. This set of higher-ordered, or *privileged possible worlds* (PPWs), is identical to the set of worlds denoted by all the alternative focus propositions, which are derived by replacing the focused constituent in a linguistic utterance by alternative expressions of the same semantic type (within some given domain); see below.[2] In short, by singling out a set of privileged possible worlds, focus indicates for which part of its containing utterance U there existed relevant alternatives before U was uttered.

For illustration, consider the standard analysis of the interpretation of the assertion in (1) in terms of common ground update (Stalnaker, 1978). Abstracting away from the role of focus for a moment, a successful assertion of (1) requires the acceptance of the state-of-affairs described by the utterance as true by the hearer. This, in turn, results in a change, or update, of the common ground, which contains all the propositions (asserted or presupposed) that are mutually accepted as true by the interlocutors. In particular, the successful assertion of (1) effects the inclusion of the proposition $p = \lambda w$. *Peter went to Paris in w* into the common ground.

Notice that common ground update is a matter of reducing and not extending the set of possible worlds by including new propositions, as the updated common ground now requires the truth of both the previously established propositions and the newly accepted utterance. In other words, a successful assertion of (1) leads to the exclusion of all the possible worlds in which the negated counterpart of p, $p^{NEG} = \lambda w$. *Peter did not go to Paris in w*, is true, from the *context set*, which is the set of possible worlds that still qualify as candidates for the actual world w_0, according to the knowledge states of speaker and hearer(s) (Diagram A1).

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[2] Technically, a set of propositional alternatives can be modelled as a set of sets of possible worlds, with the set-theoretic unification of which constituting the set of privileged possible worlds.
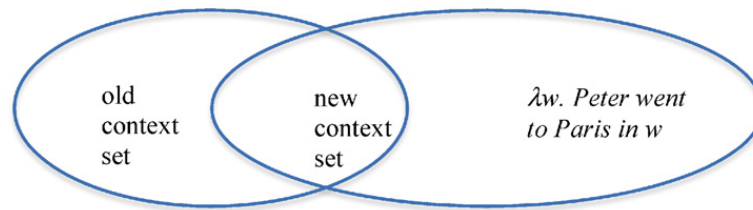
Diagram A1. Restriction of context set through successful assertion.

Let us now consider what the contribution of focus in (1) adds to this picture. We propose that the focus status of the subject imposes the ordering relation in (2) on the set of possible worlds. We arrive at this representation by calculating the union of propositions (thought of as sets of worlds) of the form *ALT(x) went to Paris*, where ALT(x) = {Peter, John, Mary, Stanislav, ...}. This constitutes the set of *Privileged Possible Worlds (PPW)*, members of which are ordered higher than any other worlds. This ordering should not be confounded with some notion of *scalarity*, though. Rather, it relates to context notions like *salience* or *relevance*, as will be discussed in an instance.

(2) $\{w: \exists x\ x\ \text{went to Paris in } w\} < \{w: \neg\exists x\ x\ \text{went to Paris in } w\}$
   PPW

Crucially, the ordering relation is not directly related to the common ground, nor does it form part of it. Rather, we think of it as a cognitive interface that features in the process of common ground update. In our view, focus alternatives help the hearer in evaluating the proposition expressed for inclusion into the common ground, and they do so by providing a preliminary context set, the *evaluation set*, which consists of the intersection of the original context set and the PPWs, as shown in Diagram A2.

Next, we consider how this conception of focus helps in answering the above question concerning the presence and relevance of focus alternatives in the interpretation process. First, we show why we think that focus does not have a direct impact on the common ground. Second, we show how – in spite of this – truth-conditional effects of focus alternatives may still come about in a more indirect way.

Above, we have argued that the contribution of focus to the common ground is of an indirect nature only. In particular, PPWs need neither be part of the context set at the time of utterance, nor need they be accommodated into the updated context set, as the set of PPWs only functions as a preliminary interface for interpretation. Instead, the PPWs constitute an interpretive background against which the proposition expressed is evaluated. In other words, the PPWs induced by subject focus in (1) signal that it is before the background of someone going to Paris that the assertion that Peter went to Paris is a relevant assertion.

Crucially, this means that focus does *not* automatically come with an existential presupposition, as argued by Geurts and van der Sandt (2004). We rather think of PPWs as *more likely candidates* for the context set update, which still allows for the possibility that none of these worlds is actually true. In this way, our position appears similar in spirit to the analysis of focus in terms of *expressive meaning* in Kratzer (2004), and especially to Büring's (2004) concept of *focus supposition*.

There are a number of empirical arguments in favor of this position. First, both Kratzer and Büring show that the anaphoric possibilities of (ordinary) focus are not the same as those observed with undisputed triggers of existential presuppositions, such as the additive particle *too*. The phenomenon shows up in contexts in which the licit antecedent of a
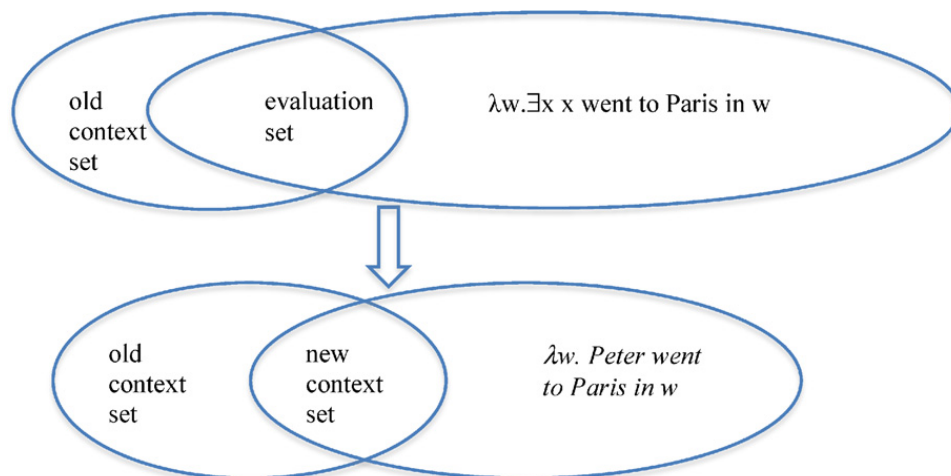
Diagram A2. Restriction of context set aided by PPWs.

focus constituent is not accessible for the resolution of an existential presupposition, and in which accommodation is blocked by the context itself. Consider the contrast between (3) and (4). The felicity of (3) suggests that focus on *JILL* is licensed by the parallel proposition embedded under the attitude verb *doubt* in the first clause. At the same time, the attitude verb *doubt* blocks the inference that the existential presupposition of the second clause is satisfied by Ed's attending the meeting. We see this quite clearly since the same embedded clause cannot function as an antecedent for the existence presupposition of *too* in (4). Together, (3) and (4) suggest that whatever the semantic effect of focus in (4) may be, it is not an existential presupposition; see also Rooth (1996:291ff.) for an argument to the same effect.

(3)   Sue doubts that Ed attended the meeting, but we all agree that JILL$_F$ attended the meeting.

(4)   #Sue doubts that Ed attended the meeting but we all agree that JILL$_F$ attended the meeting *too*.

Another argument against the putative existential presupposition of focus, already noticed in Jackendoff (1972), comes from the fact that negative quantifiers can be focused on their own, as shown in (5). If we were to assume that at least one world in the set of PPWs were true, i.e., if focus were to come with an existential presupposition, (5) should be a plain contradiction, which it is clearly not.[3]

(5)   NOBODY$_F$ went to Paris.

Let us take stock at this point: We argued that focus introduces a set of privileged possible worlds into the interpretation process, which makes it an interface phenomenon affecting the processing of utterances in the dynamic update of the common ground. We have also argued that focus is not directly related to the actual content of the common ground, in that it does not introduce an existential presupposition. After elucidating what is *not* the function of PPWs, it still remains to be shown what they are actually good for. We consider two particular aspects in which focus can be relevant for the semantic and pragmatic interpretation of an utterance. First, we consider an indirect impact of focus on interpretation, which relates more to common ground management and pragmatic inferencing. Following that, we discuss truth-conditional effects of focus that arise in connection with focus-sensitive particles.

Above, PPWs were argued to provide a more restricted search space that makes it easier for the hearer of an utterance like (1) to evaluate, and eventually accept or reject, the actual proposition expressed by (1). Hence, it is with respect to the potential knowledge that someone went to Paris that (1) must be interpreted. Intuitively this amounts to the *answer space*, characterized by the meaning of the *wh*-question *Who went to Paris?* (see e.g., Hamblin, 1973; Karttunen, 1977; Groenendijk and Stokhof, 1982, 1984; Rooth, 1996; Roberts, 1996, among many others). And indeed, we think of these two notions as two sides of the same coin. It is for this reason that the constituent substituting for the *wh*-expression in the question is typically considered a *bona fide* focused constituent. Consequently, answers to *wh*-questions are commonly used as diagnostics for focus and its grammatical realization (see section 2). In the further process of pragmatic interpretation, the focus information may optionally be exploited for additional pragmatic strengthening procedures, as is the case with exhaustiveness implicatures to the effect that the proposition in (1) is the only true among the set of alternative propositions. Such additional pragmatic inferences are typically considered as interpretive effects beyond truth conditions. We will come back to this problem in discussing some special cases of focus that seem to involve the stronger, and possibly even semantic, notion of exhaustiveness in section 3.

More technically speaking, the correspondence between PPWs and the answer space delimited by a *wh*-question is not entirely trivial: there are, for instance, cases in which the set of PPWs is identical to the entire set of logically possible worlds *L* on standard assumptions. For instance, the PPWs for *The smallest prime number higher than five is SEVEN* would rule out any worlds in which there is no smallest prime number higher than five, but this happens to be the empty set. Since the sentence *The smallest prime number higher than seven is ELEVEN* would delimit exactly the same set of PPWs, this would seem to imply that both sentences should be felicitous answers to the questions *What is the smallest prime number higher than five?* and *What is the smallest prime number higher than seven?*, respectively, contrary to fact. Notice, though, that the same problem applies to intensional focus semantics in general, since in this case all focus alternatives would denote the empty set as well, for they would all be logically false and, hence, indistinguishable (see e.g., Krifka, 2006 for some general remarks on intensional focus semantics). For instance, all conceivable alternatives to *The smallest prime number higher than seven is ELEVEN* are not only false in the actual world, but actually denote the empty set of worlds, since there are no conceivable worlds, in which the smallest prime number higher than seven is twelve, thirteen, etc. So, the problem our account runs into is of a more general nature, and thus irrelevant to the specific concerns of this paper. Because of this, we will defer to a later occasion a detailed discussion of the technical constraints required in an intensional model that would avoid such problems, and thus guarantee the existence of a function from the PPWs delimited by a sentence s and its standard denotation p to the set of possible answers to a question Q. For the time being, we will simply assume that such a function exists, and that PPWs do in fact delimit exactly one question answered by the sentence containing the focused constituent.

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[3] Note that Geurts and van der Sandt (2004) claim that (5) constitutes an instance of polarity focus instead of narrow focus on the subject. This approach is at odds with the quest for unified account of focus, though, in that, apart from not having an existential presupposition, it is difficult to see why narrow focus on the subject in (5) would be blocked.

As mentioned above, there are also cases in which focus, and, hence, PPWs, appear to have a direct effect on the semantic interpretation of an utterance by affecting its truth-conditions. This typically happens with the interpretation of so-called *focus-sensitive expressions*, such as, e.g., focus particles (*only*, *even*), negation, quantificational adverbs (*always*), and modal expressions (modal verbs, conditionals), all of which can be analyzed as operators over sets of possible worlds. In (6), for instance, the presence of the focus particle *only* excludes all the possible worlds in which Marek bought anything else other than *pizza* in Gdansk, while (6) excludes all the worlds in which Marek bought pizza anywhere else but in *Gdansk*. It is easy to see that in both cases the exclusion affects only alternative propositions that are included in and therefore determined by the set of PPWs indicated by the respective foci.

(6)   a.   Marek only bought PIZ\za in Gdansk.

       b.   Marek only bought pizza in GDANSK\.

More generally, we take it to be an advantage of our approach to focus as imposing an ordering relation on possible worlds that it immediately predicts that any kind of modal expressions ought to be focus-sensitive, at least in principle. This is because focus effects are registered in the domain of possible worlds and because modal expressions are commonly thought of as quantifying over sets of possible worlds (Kratzer, 1977, 1991a). From this perspective, then, PPWs can be viewed as providing highly salient restricted (world) domains of quantification for modal operators.

The analysis of focus sensitive particles as quantifying expressions over PPWs can be conceptualized from a more communication oriented perspective as well. Such a pragmatic interaction between PPWs and some focus-sensitive expressions has been proposed in recent research by Beaver and Clark (2008). Still, even these authors' pragmatic approach to focus-sensitivity gives PPWs a crucial role to play in the interpretation of utterances containing focused elements: the focus-sensitivity of *only* is derived by means of a twofold conventional association between *only* and *wh*-questions, on the one hand, and focus and *wh*-questions, on the other. In our view, the correspondence between focus and questions is mediated through the set of PPWs. Notice, however, that the position taken here is weaker than the position of Beaver and Clark (2008), which postulates the (implicit) existence of an appropriate question under discussion with every instance of focus. This is seen, for instance, in the case of embedded sentences, as in (3), in which the role of a so-called local (embedded) question may not be easy to conceptualize, but where PPWs clauses can be also viewed as just providing a local evaluation context, without explicitly recurring to a question.

In the cross-linguistic literature on focus-sensitivity, it has been observed that exclusive expressions such as *only* (and perhaps scalar particles such as *even* as well) are the only instances of focus-sensitive expressions that must conventionally associate with focus, i.e., which seem to require focus alternatives, or PPWs, for a proper semantic interpretation; see Beaver and Clark (2008) for detailed discussion. By contrast, virtually all other focus-sensitive expressions, and in particular additive particles corresponding to *also/too*, do not exhibit such a tight relation to focus (realization), leading to the conclusion that these elements do *not* conventionally associate with focus; see e.g., Hartmann and Zimmermann (2008) on Bura (Central Chadic), Koch and Zimmermann (2010) on Nłe?kepmxcin (Salish), and Grubic and Zimmermann (2011) on Ngamo (West Chadic). In light of these observations, the answer to the question of why exclusives like *only* are inherently focus-sensitive expressions may well relate to the fact that the semantic operation of exclusion explicitly calls for a domain restriction to be provided by the set of PPWs.

The idea that focus imposes an ordering relation on the domain of possible worlds by singling out a set of privileged possible worlds that can assist the hearer in evaluating a given utterance, provides a precise account for the basic intuition that the focus of an utterance indicates the presence of alternative propositions relevant for its interpretation. This way of thinking about focus helps to avoid a number of misunderstandings about the place of focus in grammar, and its impact on interpretation. At the same time, this idea is compatible with the two standard compositional semantic theories of focus interpretation, *structured meanings* and *alternative semantics*, which we briefly discuss in the following.

1.3. Structured meanings

Structured meanings, and in particular structured propositions, were introduced into the semantic literature by Cresswell and von Stechow (1982), and most prominently applied to the modeling of focus semantic phenomena by Jacobs (1983), von Stechow (1982, 1990, 1991) and Krifka (1991, 1995, 2001). The central idea behind the structured meaning account is that focus leads to a bi-partition of the asserted truth-functional meaning of an utterance into an unsaturated background part, on the one hand, and a focus part, on the other, such that the background part applied to the focus part yields again the ordinary truth-functional meaning (von Stechow, 1982). The structured meaning representation of (7), with narrow focus on the object, is shown in (8), and the structured meaning of (9), with narrow focus on the subject, is given in (10).

(7)   Peter invited MAry$_F$

(8) $<\lambda x \in D_e$. Peter invited x, Mary$>$

(9)   PEter$_F$ invited Mary.

(10) $<\lambda x \in D_e. \text{ x invited Mary, Peter}>$

In (8) and (10), the underlying semantic nature of focus as indicating alternatives is reflected by the presence of a variable inside the background predicate. The bi-partition of the semantic representations in (8) and (10) is also compatible with syntactic accounts of focus put forward in the generative tradition; see e.g., Chomsky (1971, 1976, 1981) and subsequent work by Brody (1990) and Rizzi (1997). Such accounts assume overt or covert syntactic movement of the focus constituent. The resulting syntactic bi-partitions serve as the input for semantic interpretation in terms of structured propositions, in full compliance with compositionality, as illustrated for (7) in (11), where the focus constituent *Mary* has raised covertly to some left-peripheral position.

(11)   LF: [**Mary** λ_1 [$_{IP}$Peter invited t$_1$]]

           $\underline{<\lambda x. \text{ Peter invited}}$ x, **mary** >

On the basis of the structural isomorphism in (11), it is often (tacitly) assumed that structured propositions are not just compatible with syntactic focus movement, but in fact require such movement; see e.g., Rooth (1985) on so-called *extraction analyses*. This has given rise to counterarguments of the type in (12) from Rooth (1985), which are based on the possible association of focus particles with elements inside syntactic islands. In (12), association of *only* with the focused constituent *Sue* inside the relative clause is possible, even though overt extraction is impossible as shown in (12). If focus interpretation *were* indeed dependent on a structural bi-partition via focus movement, the association behavior of *only* in (12) would come as a surprise.

(12)   a.   Peter **only** liked [the man that introduced **SUE$_F$** to Bill]
           b.   *****Whom$_1$** did Peter only like [the man that introduced **t$_1$** to Bill]

However, as shown in Beaver and Clark (2008), the identification of focus-structured propositions does *not* require syntactic bi-partitioning, but can be read off the syntactic surface structure with the focus constituent remaining *in situ*. Consequently, all arguments against structured propositions that are based on the impossibility of syntactic movement in certain configurations lose their validity, and the structured meaning approach maintains its status of a state of the art system of semantic focus representation.

1.4. Alternative semantics

The framework of *alternative semantics* has been mainly developed in a series of articles by Rooth (1985, 1992, 1996). Its original motivation was to overcome certain weaknesses of extraction analyses (see above), which crucially rely on syntactic focus-movement, by deriving the semantic representation of focus *in situ*.

The central idea of alternative semantics is that the meaning contribution of focus is registered at a second semantic level, the *focus semantic value*, $[\![ ]\!]^F$, which is computed in parallel to the *ordinary semantic value*, $[\![ ]\!]^0$, of an utterance. The ordinary semantic value corresponds to the standard extensional meaning of lexical expressions and clauses, the latter being reached at by standard compositional procedures, while the meaning contribution of focus is factored out. The focus semantic value, by contrast, is identified in different ways; see Rooth (1985:14): the focus value of non-focused lexical material is the singleton set containing its ordinary semantic value; the focus semantic value of a focused expression of a given semantic type is the set containing all semantic objects of the same semantic type; finally, the focus semantic value of a complex expression *containing* a focused constituent is computed by point-wise functional application of each element of the focus semantic value of one daughter node to each element of the focus semantic value of the other daughter node. The computation of the ordinary and focus semantic values of (7) is exemplified in (13).

(13)   Peter invited MAry$_F$

           a. $[\![\text{Mary}_F]\!]^0$ =   Mary
                 $[\![\text{Mary }_F]\!]^F$ =   {Mary, Ann, Peter, Claudia...}

           b. $[\![\text{invited}]\!]^0$ = $\lambda x.\lambda y.\lambda w. \text{ y invited x in w}$
                 $[\![\text{invited}]\!]^F$ = $\{\lambda x.\lambda y.\lambda w. \text{ y invited x in w}\}$

           c. $[\![\text{invited Mary}_F]\!]^0$ = $\lambda y.\lambda w. \text{ y invited Mary in w}$
                 $[\![\text{invited Mary}_F]\!]^F$ = $\{\lambda y.\lambda w. \text{ y invited Mary in w}, \lambda y.\lambda w. \text{ y invited Ann in}$
                                                             $\text{w}, \lambda y.\lambda w. \text{ y invited Peter in w}, \lambda y.\lambda w. \text{ y invited Claudia in w},...\}$

d. $[\![Peter]\!]^O$ = Peter

$[\![Peter]\!]^F$ = {Peter}

e. $[\![Peter\ invited\ Mary_F]\!]^O$ = $\lambda w.$ Peter invited Mary in w

$[\![Peter\ invited\ Mary_F]\!]^F$ = {$\lambda w.$ Peter invited Mary in w, $\lambda w.$ Peter invited Ann in w, $\lambda w.$ Peter invited Peter in w, $\lambda w.$ Peter invited Claudia in w, …}

Shifting the focus from the object *Mary* to the subject *Peter*, as in (9), does not affect the ordinary value of the sentence, but, as the reader may verify for herself, the focus shift *does* change the set of alternative propositions to those in (14), which differ in the value for the focused subject argument.

(14) $[\![PEter_F\ invited\ Mary]\!]^F$ = {$\lambda w.$ Mary invited Mary in w, $\lambda w.$ Ann invited Mary in w, $\lambda w.$ Peter invited Mary in w, $\lambda w.$ Claudia invited Mary in w, …}

In subsequent research, it was shown that this unconstrained system of alternative semantics makes available too many alternatives, and allows for a number of incorrect predictions; see, for instance, Kratzer (1991b) and Krifka (2006). Moreover, the original version of alternative semantics makes no direct reference to the observed discourse-anaphoricity of focus, as most directly exhibited in question–answer pairs and in corrections. In response to these problems, Rooth (1992) proposes a more constrained version of alternative semantics that crucially relies on a context variable C, which refers to a contextually given set of alternatives, and a focus operator '∼', which mediates between the unconstrained set of focus alternatives, on the one hand, and the contextually restricted value of C, on the other: Simplifying somewhat, the ∼-operator introduces a presupposition requiring the value of C to be a subset of the (unconstrained) set of focus alternatives, as illustrated in (15) from Rooth (1996):

(15)   Q: Does Ede want tea or coffee?

A: $[_{S'} [_S$ Ede wants TEA$_F$] ∼**C**]

In (15), the value of C is contextually specified by the immediately preceding question Q, which denotes the following set of propositions: {$\lambda w.$ *Ede wants tea in w*, $\lambda w.$ *Ede wants coffee in w*}. Since the unrestricted set of alternative propositions A (induced by the focus on *TEA*) contains only propositions of the form $\lambda w.$ *Ede wants x in w*, the denotation of C is a subset of A, such that the focus presupposition introduced by '∼' is satisfied. By contrast, the infelicitous answer *EDE wants tea* (with focus on *EDE*) is ruled out as an answer to (15) because C does *not* form a subset of the set of focus alternatives of the form $\lambda w.$ *x wants tea in w*. In conclusion, the modified system of alternative semantics is sufficiently constrained for serving as an adequate model for the semantic effects and for the discourse-anaphoricity of focus in natural language, even though more would need to be said about the ontological status of the set of alternatives in C.

1.5. Discussion

Alternative semantics and the structured meaning approach to focus are both based on the same underlying concept of focus as indicating alternative propositions to the proposition expressed by an utterance. Both formal representations account equally well for the bulk of empirical phenomena observed with focus, and they differ only in minor ways in their empirical predictions that shall not concern us here; see e.g., Rooth (1996) and Wold (1996) for relevant discussion. In addition, either formal representation is compatible with syntactic accounts in terms of focus movement (at LF), on the one hand, and with *in situ* accounts without focus movement, on the other. Moreover, both representations are compatible with recent pragmatic analyses that treat focus as a discourse-structuring device, and according to which the central function of focus in declarative utterances is to specify the questions that can be answered by these utterances; see Roberts (1996), Büring (2003), Beaver and Clark (2008). Such questions, which have been alternatively referred to as *question under discussion* (QUD) (Roberts, 1996) or as *current question* (CQ) (Beaver and Clark, 2008), can be made explicit, as in question-answer pairs (new information focus), but they may also be implicit, such as, for instance, in corrections (contrastive focus) or in out-of-the-blue utterances, in which case they can only be identified under recourse to the focus alternatives. Finally, we would like to stress once more that neither of the two frameworks attributes any truth-conditional semantic effects to plain foci in the absence of focus-sensitive expressions.

In spite of their overall similarities, the two frameworks differ in one crucial respect, which is the ontological status they assign to focus in semantic theory in particular, and in the architecture of grammar more generally. In the structured meaning-account, the focus forms an integral part of the asserted meaning as part of the structured proposition. In alternative semantics, by contrast, focus only helps to identify the relevant alternatives, which are registered at an independent level of meaning, the focus value. In other words, focus constitutes a necessary link between a given utterance and the preceding discourse in alternative semantics, whereas focus comes in directly at the level of assertion in the structured meaning account.

Under our conception of focus as an information-structural means of guiding the hearer in the updating of the common ground, this appears to be more than just a notational difference. In particular, we have argued above that focus does *not*

necessarily link an utterance to the preceding discourse. Rather, focus provides a general evaluation interface for natural language utterances that can, at times, be exploited as a discourse link, for instance, when focus is employed in answering a question. Structured meanings seem to capture this characteristic of focus in a more direct way, especially considering the unclear ontological status of the C presupposition in alternative semantics, which is obviated in structured meanings approaches.

In conclusion, we propose that focus should be conceived of as a universal category at the level of information structure which plays a decisive role in common ground management and information update. In particular, focusing facilitates such updates by indicating which alternatives are directly relevant for the evaluation of a given assertion in a particular context. The semantic contribution of focus can be modeled in a unified way, either by introducing focus alternatives, or by assuming a semantic bi-partition of assertions in terms of focus and background, where the latter option appears to capture the conceptual function of focus in a more transparent way.

More importantly, we hold that focus, being an information-structural category, should receive a unified treatment across languages and across different pragmatic functions. This central tenet immediately gives rise to the questions of how to account for the observable cross-linguistic variation in the grammatical strategies employed for realizing focus, on the one hand, and of how to account for the observable variation in the pragmatic uses of focus, on the other. We will attend to these two questions in sections 2 and 3, respectively.

2. Variation and under-determination in focus marking

The characterization of focus as an information-structural category in section 1 makes it necessary to distinguish the information-structural category of *focus*, on the one hand, from its grammatical manifestation in a given language, on the other. We follow Büring (2010), in using the term *focus realization* in order to refer to the linguistic realization of the information-structural category *focus* by way of special grammatical means, such as, for instance, focus accenting, syntactic reordering, morphological markers, etc. While the central function of such explicit grammatical marking is to aid the hearer in identifying the focus-background structure of an utterance, it should be observed that the grammatical realization of focus is often ambiguous, or heavily underspecified, in the sense that it is compatible with more than one focus-background structure. Also notice that the term *focus realization*, when used in this general way, does not imply that the formal devices employed in the marking of focus are exclusively found in focus constructions. Indeed, such formal devices can also be found in other environments in many languages.

Given the distinction between focus and focus realization, it is not the presumably universal information-structural category of focus, but rather the grammatical realization of focus, which is subject to cross-linguistic variation. As has often been observed, languages show a wide variation in the grammatical means employed for marking a focused constituent as such, ranging from phonological/prosodic devices (accenting, prosodic phrasing), over syntactic devices (reordering) to morphological devices (focus markers). In this section we first discuss the problem of the absence of a clear one-to-one mapping between focus and focus realization in English and German. Next, we turn to different grammatical strategies that are employed for realizing focus explicitly in the languages of the world.

2.1. Under-determination in focus marking

Given the above characterization of focus as a universal cognitive or semantic category at the level of information structure, and not as a genuine linguistic category, we do not expect the formal marking of focus to be mandatory in each and every language. More importantly, we do not expect languages to have focus marking devices that would yield a strict one-to-one mapping between focus and its grammatical realization. In other words, focus is expected to be formally underspecified, and thus in need of contextual resolution, in many, if not all languages. In fact, since the utterance context heavily reduces the number of worlds relative to which an utterance is evaluated, e.g., in the presence of a *wh*-question, the explicit realization of focus might even seem superfluous at times. Let us consider English and German, as fairly well studied languages, to gain a better understanding of the problem.

Intonation languages like German and English realize focus prosodically by means of *pitch accenting*. Simplifying somewhat, the focus constituent must carry the *nuclear pitch accent*, which is the last in a series of falling H*L pitch accents (see e.g., Selkirk, 1984, 1995 for English; Uhmann, 1991; Féry, 1993; Büring, 2001 for German). This is illustrated, once more, in (16) for object and verb focus, respectively:

(16)   a.   Q: What did Peter sell?
               A: Peter sold [the CAR\]$_{FOC}$.

        b.   Q: What did Peter do with the car?
               A: He [SOLD\]$_{FOC}$ the car.

However, a closer look reveals that the seemingly neat one-to-one correspondence between IS-focus and its grammatical correlate, the nuclear pitch accent, is only apparent in English or German. In fact, the under-specification of the grammar-IS

mapping goes both ways: First, in sentences containing only a single focus accent, a single prosodic pattern can be mapped onto different focus-background structures. This is illustrated in (17), where a nuclear pitch accent on the most deeply embedded (object) DP in (17) can alternatively indicate *narrow focus* on the object DP (Q1), or VP-focus (Q2), or all-new focus on the entire sentence (Q3). This phenomenon is commonly referred to under the labels of *focus ambiguity* and *focus projection* in the literature (see e.g., Selkirk, 1984, 1995; Jacobs, 1991). Which focus structure is actually expressed by (17) is for the most part subject to contextual resolution.

(17)   Q1:   What did Peter buy?
        Q2:   What did Peter do?
        Q3:   What happened?
        A: Peter bought a book about BATS\.

Conversely, it is possible for one and the same focus-background structure to be expressed by means of different prosodic realizations. For instance, a sentence may contain (additional) pitch accents in the pre-focal domain, as long as the nuclear pitch accent is located on the focus constituent itself. This is illustrated in (18) from Büring (2007), who refers to the additional pre-focal accents as *ornamental pitch accenting*, indicating that their presence is NOT governed by IS-needs, but possibly by independent phonological factors.

(18)   Q: Who did Gus vote for?
        A: GUS VO\ted [for a FRIEND\ of his NEIGH\bors from LIT\tleville]$_F$

Nonetheless, English realizes focus consistently in the sense that the focus constituent must always contain the final pitch accent, or nuclear pitch accent, in a series of accents. In this sense, English can be said to rely on prosodic cues, in addition to contextual information, when it comes to identifying the focus of a sentence (Féry, 2008). An apparent exception to this generalization is presented by instances of so-called *second occurrence focus* (SOF), as illustrated in (19), in which the associate of a focus-sensitive particle (see section 1.2) is given in the preceding discourse, and thus cannot carry a nuclear pitch accent (cf. Partee, 1999).

(19)   If even [Paul]$_F$ knew that Mary only eats [vegetables]$_{SOF}$, then he should have suggested a different restaurant.

Recent experimental work has shown, though, that second occurrence foci retain some sort of prosodic prominence in terms of intensity, duration, or phrasing; see Beaver et al. (2007) and Beaver and Velleman (this issue) for detailed discussion. In light of this observation, it is fair to say that any instance of focus in English, or German, is at least weakly correlated with some sort of absolute prosodic prominence.

Another confounding factor is that there are focus-independent rules of accent placement: in some cases, it may be that the constituent carrying the main accent is not focused, since it carries the main accent only by default. Consider example (20) from Umbach (2009), who argues that the location of pitch accent on the additive particle *noch* 'more' is not to be interpreted as expressing focus on the particle, but rather as the result of de-accenting all the other constituents in the clause, which are discourse-given in the sense of Schwarzschild (1999). A similar argument has been put forward by Féry (2008) in order to account for the accented occurrence of the German additive particle *auch* 'too' in examples like (21)

(20)   Context: Otto had a schnapps after dinner, and you won't believe it:
        Otto hat NOCH einen Schnaps getrunken.
        Otto has more one schnapps drunk
        'Otto had another schnapps'.

(21)   Context: Boy, Paul owns a Gauguin.
        Einen   GAUGUIN   besitzt   Peter   AUCH.
        a   gauguin   owns   Peter   too
        'Peter owns a Gauguin, too'

In light of these observations, it is safe to conclude that the assumption of a strict one-to-one mapping between focus and its grammatical realization is not tenable for English or German. As will emerge in the following sub-section, the existence of a one-to-one mapping between focus and focus realization is even less feasible for other languages.

At this point, we hasten to clarify a possible misunderstanding: By saying that focus is not a grammatical category, we do not intend to say that whatever (conventionalized) focus marking devices are used in a language are not grammatical categories. Of course, grammar should be able to explain and predict the correct pitch accent patterns in a language like English (but see Bolinger, 1972 for a more pessimistic view). And if necessary, focus may play a significant role in such a predictive system. The point here is, simply, that focus cannot play the sole role.

Beaver and Velleman (this volume) show for English that the degree of underspecification at the information structure-prosody interface is even larger than previously thought. In response to their findings, they develop a predictive model in which the notion of focus plays an important role, but in which it is not the one and only decisive factor in accent placement.

2.2. Cross-linguistic variation and asymmetries in the realization of focus

2.2.1. Prosodic means of realizing focus

In our discussion of the English and German examples above, we have noted that focus tends to be realized by means of a nuclear pitch accent in these languages. This strategy is widely employed in intonation languages, but, in addition, there are other prosodic means of realizing focus observed in the languages of the world.

Some tone languages, such as, e.g., Chîchewa, realize the focus-background structure of an utterance by inserting a *phonological phrase boundary* before or after the focus constituent (Kanerva, 1990). In contrast to the unmarked all-new Chîchewa sentence in (22), narrow focus on object and verb is marked by the insertion of a phonological phrase boundary after the respective focus constituents in (22) and (22). In each case, the presence of a phrase boundary is indicated by penultimate lengthening (u >> uu, é >> éé) and tone lowering on the final syllable of the immediately preceding word (á >> a).

(22) a.   (Anam**é**ny**á**   ny**u**mb**á**   ndí mwáála)   *all-new*
              s/he hit   house   with stone
              'S/he hit the house with a stone.'

      b. Q: What did he hit with a stone?'
          A: (Anaményá   *ny**uú**mb**a***)   (ndí mwáála)   *O-focus*
              s/he hit   house   with stone

      c. Q: What did he do to the house with the stone?
          A: (*Anam**ée**ny**a***)   (ny**uú**mb**a**)   (ndí mwáála).   *V-focus*
              s/he hit   house   with stone

Japanese seems to employ a combined strategy of prosodic focus marking that involves both f_0-manipulations as well as prosodic phrasing (Beckman and Pierrehumbert, 1986): First, focused constituents receive an increased tonal pitch as compared to the lexically coded accent. Second, an intermediate phrase boundary is inserted to the left of the focused constituent. Finally, all intonational phrase boundaries to its right are removed; see Büring (2010) for examples and a detailed cross-linguistic overview of the prosodic strategies employed in the realization of focus.

2.2.2. Morphological realization of focus

There are also languages like Wolof (West Atlantic, Robert, 1986; Kihm, 1999) and Gùrùntùm (West Chadic), which realize focus by means of morphological focus *markers*. The following data from Hartmann and Zimmermann (2009) illustrate this for subject and object focus in Gùrùntùm (SVO), which are realized by the focus marker *a* preceding the focus constituent:

(23) a. Q: WHO is chewing the colanut?
          A: **Á**   *fúrmáyò*   bà   wúm   kwálíngálá.
              FOC   fulani   PROG   chew   colanut
              'THE FULANI is chewing colanut.'

      b. Q: WHAT is he chewing?
          A: Tí   bà   wúm-**á**   *kwálíngálá.*
              3SG   PROG   chew-FOC   colanut
              'He is chewing COLANUT'.

Interestingly, the *a*-marker in Gùrùntùm is not always found in *all-new* sentences. This finding can be taken as another argument for the non-existence of a strict one-to-one mapping between focus and focus realization, cf. Büring (2010) for discussion.

2.2.3. Syntactic reordering

Other languages, such as Hungarian, Hausa, and Nłe?kepmxcin (Thompson River Salish), realize focus by placing the focus constituent in a designated syntactic position. If this special focus word order is not in accordance with the canonical all-new word order of the language, it must be derived by syntactic re-ordering in form of *focus movement* or *clefting*; see e.g., Chomsky (1971), Brody (1990), Rizzi (1997), among many others. We refer to focus constituents that do not occur in their

underlying base positions as *ex situ* foci. To cite a well-known example, focus in Hungarian is typically thought of as being realized in the immediately pre-verbal position, as illustrated in (24) from Szabolcsi (1981).

(24)   a.   Péter   [*a padlón*]$_{FOC}$ aludt.

           Peter   on floor   slept.

           'Peter slept on the FLOOR'.

   b.   A padlón   [*Péter*]$_{FOC}$ aludt.

           on floor   Peter   slept.

           'PETER slept on the floor'.

In the V-initial Salish language Nłe?kepmxcin, the focus constituent is always realized as part of the sentence-initial predicate (Koch, 2008; Koch and Zimmermann, 2010). If the focus falls on a DP-argument of the verb, this syntactic requirement is satisfied by clefting the focus constituent in initial position, cf. (25):

(25)   a.   Q: What's going on?   [all-new]

           A: w?éx=xe?=ne?   ?es-téł-ix   e=Pátricia.

                IMPF=DEM=DEM   STAT-stand-INTRANS   DET=Patricia

                'Patricia is standing there'.

   b.   Q: WHO painted it?   [S-focus]

           A: čé   [ł=Róss]$_{FOC}$ [e   pínt-t-Ø-mus]

                CLEFT   DET=Ross   COMP   paint-TRANS-3O-SUBJ.GAP

                'ROSS painted it.'

Recall from section 1.3 above that the application of syntactic focus movement or focus clefting typically results in an overt bi-partition into focus material, on the one hand, and background material, on the other. In the normal case, this allows for a transparent mapping from the grammatical form of a clause to its focus-semantic representation. A particularly interesting instance of syntactic partitioning is discussed in Hole (this issue): so-called *shi…de*-clefts in Mandarin Chinese exhibit an underlying partition that is partially obscured by independent PF-requirements and can thus only be identified on the grounds of word order restrictions and certain semantic properties, namely the exhaustive interpretation of the focus-clefted constituent; see section 3.3.

Similar to languages with morphological marking, languages with *ex situ* focus marking do not exhibit a strict one-to-one mapping between focus realization and focus either: in Hungarian, for instance, only one constituent can be moved to the focus position. Hence, in sentences with multiple instances of focus all but one focused constituent have to remain *in situ*.

(26)   a.   Ki kit csókolt meg?

           Who whom kissed PRT

           'WHO kissed WHOM?'

   b.   MARI csókolta meg PÉTERT.

           Mary kissed PRT Peter

           'MARY kissed PETER'

2.2.4. Mixed strategies

One and the same language may also have different grammatical strategies of realizing focus at its disposal. In Hungarian, for instance, pitch accent plays a role in realizing focus in addition to syntactic reordering (Szendröi, 2003). For one thing, the constituent moved to the preverbal position must carry the main pitch accent of the sentence. Moreover, pitch accent may disambiguate the focused element in case of complex DP- or PP-constituents that are moved into the focus position, as illustrated in (27) for narrow focus on adjectival modifier and numeral, respectively; see Roberts (1998).

(27)   a.   Q: What kind of car did Peter buy.

           A: Péter [egy PIRos autót] vett.

                Peter a   red   car   bought

                'Peter bought a RED car'

    b.   Q: How many red cars did Peter buy.

          A: Péter [EGY piros autót] vett.

              Peter   a   red   car   bought

              'Peter bought ONE red car'

2.2.5. Asymmetric marking

A final important empirical argument against the assumption of a strict one-to-one mapping between focus and focus realization comes from the observation that many West African tone languages exhibit structural asymmetries in the realization of focus. In a series of articles, Hartmann and Zimmermann (2007a,b) and Fiedler et al. (2010) have shown that many Chadic languages (Afro-Asiatic), including Hausa, and many Kwa languages (Niger-Congo), including Akan, Ewe and Fon, distinguish between subjects and non-subjects (e.g., objects and adjuncts) when it comes to the grammatical realization of focus. In these languages, focus on subject constituents is always unambiguously expressed in a grammatically marked way, where *marked* here translates as 'different from the canonical structure employed in all-new sentences'. This is illustrated for the SVO-language Fon in (28) from Fiedler et al. (2010), in which the focus status of the sentence-initial subject is indicated by the mandatory presence of the focus marker *wè*. Focus on non-subjects, by contrast, is typically realized in form of the canonical structure in (28), which is also the canonical realization of the clause observed in all-new contexts. Optionally, focus on non-subjects can also be realized by means of a non-canonical sentence structure involving reordering, as indicated in sentence (28), in which the focused object has fronted to the sentence-initial position and is (optionally) accompanied by the focus marker.

(28)   a.   Q: Who ate (the) beans?

             A: **nyɔ̀nú**   **ɔ́**   ***(wè)**   ɖ   àyìkún.   [S-focus]

                  woman   DEF   FM   eat   bean

                  'THE WOMAN ate the beans'.

    b.   Q: What did the woman eat?

             A1:   é   ɖ   **àyìkún**.   [O-focus: unmarked]

                 3SG   eat   bean

                 'She ate BEANS'.

             A2:   **àyìkún**   **(wè)**   nyɔ̀nú ɔ́   ɖ   [O-focus: marked]

                 bean   FM   womanDEF   eat

                 'It is BEANS that the woman ate'.

These examples illustrate the point that many languages of the world do not require non-subject focus to be explicitly marked in their grammatical systems; see also Lambrecht (1994), Skopeteas and Fanselow (2009) for discussion. In the absence of explicit focus marking, the focus-background structure is massively underdetermined by the grammatical system, and hence in need of contextual resolution. More generally, the existence of asymmetries in the grammatical realization of focus casts doubt on accounts in the tradition of Jackendoff (1972), which relate the information-structural prominence of a focused constituent and its grammatical realization by means of (mandatory) abstract F-features.

3. Focus uses and their grammatical realization

In section 1, we have put forward a unified information-structural characterization of focus in terms of alternatives that assist the hearer in the updating of the common ground. This unified characterization seems to be at odds with the observation from the preceding section that focus constituents are grammatically marked in different ways, even within one and the same language. When this happens, the more marked grammatical realization typically corresponds to a more marked interpretation in ways to be made more precise below. Likewise, we have seen that there is no strict one-to-one correlation between the general notion of focus and particular marking strategies, but this still leaves open the possibility of there being a one-to-one mapping between a particular grammatical realization and particular subtypes of focus. In this final section, we first show how the alternative-invoking nature of focus can be exploited to various pragmatic ends, so that we end up with different pragmatic uses of focus, or pragmatic *focus types*. We then turn to the question of whether there is a strict correlation between particular focus types and particular grammatical markings, which will be answered in the negative. We conclude the section by briefly considering additional semantic effects that regularly show up with particular grammatical realizations of focus, and in particular exhaustiveness effects.

3.1. Pragmatic uses of focus

In section 1.2, we argued that the information-structural category of *focus* makes available a set of *focus alternatives* A, which facilitates the task of updating the common ground for the hearer. Obviously, such focus alternatives can be exploited

to various pragmatic ends depending on the specific intentions of the discourse participants in a given discourse situation (Rooth, 1992; Schwarzschild, 1999). This motivates the assumption of different pragmatic *focus types*. The functional-descriptive literature (Dik, 1997) identifies a whole range of such focus types, including *information focus*, *corrective focus*, *selective focus*, and *contrastive focus*, among others. On the null hypothesis that all these focus types involve focus alternatives, the differences between the various focus types can be fleshed out in terms of the ways in which the ordinary meaning α of a focus constituent X_F interacts with the set of alternatives A introduced by the focus status of X_F; see also Hartmann and Zimmermann (2009):

i. A focus constituent X expresses *new-information* if α introduces an element of A into the common ground, and if the alternatives to α have not been explicitly introduced in the preceding discourse, cf. (29);

ii. A focus constituent X is used *correctively* if α competes with one ore more elements of A for introduction in the Common Ground, where α's competitors have been explicitly mentioned in the preceding discourse, cf. (29);

iii. A focus constituent X is used *selectively* if α introduces an element of A into the common ground, and α is chosen from a restricted subset of A the members of which have been explicitly mentioned in the preceding context, cf. (29);

iv. A focus constituent X is used *contrastively* if α is juxtaposed to one or more elements of A that are denoted by constituents Y, Z, ... in the preceding discourse, where Y, Z, ... are of the same syntactic category and denote into the same semantic word field as X, cf. (29).

(29) a. (Which color did Peter paint his bicycle?)
          He painted it [blue]$_F$.   α = blue, A = {blue, red, green, pink,...}

       b. (Peter painted his bicycle red.)
          No, he painted it [blue]$_F$ α = blue, A = {blue, red, green, pink,...}

       c. (Did Peter paint his bicycle red or blue?)
          He painted it [blue]$_F$.   α = blue, A = {blue, red, green, pink,...}

       d. Paul painted his bicycle$_i$ [red]$_F$,
          and Peter painted it$_i$ [blue]$_F$.   α = blue, A = {blue, red, green, pink,...}

Unfortunately, the terminology presented here is not used in a consistent manner in the literature, nor is any competing terminology, which makes it difficult at times to compare claims on the interpretation of certain kinds of focus across languages. There is a general tendency, however, to distinguish between two prominent subtypes of focus, namely *information focus* and *contrastive focus* (Halliday, 1967; Rochemont, 1986; Lambrecht, 1994; Kratzer and Selkirk, 2007). *Information focus* is commonly thought of as that part of the utterance that introduces new information into the discourse, e. g., by providing an answer to a *wh*-question (see above), whereas *contrastive focus* is thought of as any instance of focus where one or more alternatives to the focused expression have been explicitly mentioned in the preceding discourse. Such a restriction to just two basic pragmatic focus types is also motivated by Krifka's (2008) claim that there is little reason – neither from a formal nor from a functional perspective – for distinguishing between selective focus and information focus with regard to the notion of contrast. Rather, the intuitively felt distinction between the two focus types should be captured in terms of the notions of *open focus* (open set of alternatives: information focus) vs. *closed focus* (restricted set of alternatives: selective information focus).

Unlike the notion of information focus, the notion of contrastive focus has been subject to more controversial debate. On a weak interpretation, the notion of contrastive focus typically refers to instances of focus in which the focus alternative(s) appear(s) *at the same level of discourse representation* as the focused expression, such as, e.g., in two parallel assertions (corrective focus), cf. (29), or two parallel parts of a single assertion (contrastive focus), cf. (29). Tomioka (2008) generalizes the notion of contrast so that it also includes instances of exhaustive answers to *wh*-questions. Finally, a prominent approach to contrastive or identificational focus (É. Kiss, 1998; Vallduví and Vilkuna, 1998) gives semantic import to the notion of contrastive focus by arguing that it involves the exclusion of at least one relevant (and salient) focus alternative, as is typically the case with instances of corrective or exhaustive focus; see section 3.3 for more discussion. This is consistent with the proposal in Kratzer and Selkirk (2007) and Katz and Selkirk (2009) that the focus associates of (exclusive) focus-sensitive particles must be contrastive, as they also involve the exclusion of alternatives. The next sub-section will discuss the distinction between information focus and contrastive focus in more detail, leading to an alternative pragmatic characterization of contrastive focus not in terms of excluded alternatives, but in terms of the speaker's estimation of the hearer's expectations regarding likely and unlikely updates of the common ground.

3.2. Contrastive focus vs. information focus

The existence of two basic focus types gives rise to the question of whether the two types only differ in the felicity conditions on their appropriate use, as argued in section 3.1, or whether the observable differences between the two focus

types would not reflect a more fundamental difference in their semantics. This question is intimately tied to the question of whether the two different types of focus are grammatically realized in different ways in the languages of the world. For instance, it has been argued for a range of languages that contrastive foci must be marked in a special way by means of special prosodic, or syntactic, or morphological means, which sets them formally apart from mere information foci; see, for instance, Vallduví and Vilkuna (1998), Molnár (2001), Gussenhoven (2004). Information focus, by contrast, is often assumed to constitute a weaker kind of focus that is marked by fewer or less prominent formal features, or which need not even be marked in any special way at all. This is what is typically observed for the West African languages discussed above. In these languages, the explicit marking of focus by means of the *ex situ*-strategy corresponds – by and large – to instances of contrastive focus, whereas the *in situ*-strategy without explicit marking of focus is typically found with instances of information focus; see Fiedler et al. (2010) and below for more discussion.

In response to the observable differences in the grammatical realization of information focus, on the one hand, and contrastive focus, on the other, many researchers have argued that the two focus types do not only differ in the way they are pragmatically used, but also in terms of their underlying semantics (Kratzer and Selkirk, 2007; É. Kiss, 1998; Vallduví and Vilkuna, 1998). As already mentioned above, it is often assumed that only contrastive focus effects the exclusion of alternatives, and is hence in need of a special structural licensing. Information focus, by contrast, can be thought of as a semantically weaker kind of focus with the simple function of introducing new information into a discourse. While the introduction of new information into the discourse may certainly be related to the presence of alternatives, as argued in section 1, for any new information qualifies as an answer to a *wh*-question, which in turn can be thought of a set of alternatives, this is by no means a strict necessity. After all, the updating of the common ground with new information can also succeed in the absence of focus alternatives and PPWs. For this reason it would seem to be a contingent question whether information focus and contrastive focus are subtypes of focus, or whether they are independent notions, as argued in Vallduví and Vilkuna (1998), Kenesei (2006), Neeleman and van de Koot (2008), among others.

Nonetheless, there is sufficient reason to doubt that a strong semantic distinction between contrastive focus and information focus is warranted. First, in languages that allow for different grammatical realizations of focus, there hardly ever is a strict one-to-one correspondence between a particular grammatical realization of a focus, say in a particular syntactic position, and a particular type of focus, say contrastive or information focus. This state of affairs is observed, for instance, in Finnish (Finno-Ugric, Uralic), which has a clearly identifiable contrast position in the left periphery of the clause (Vallduví and Vilkuna, 1998), but which allows for contrastively focused elements to be realized *in situ* nonetheless (Molnár and Järventausta, 2003). Moreover, Hartmann and Zimmermann (2007a) show that the sentence-initial *ex situ* focus position in Hausa (Chadic, Afroasiatic) can be occupied by expressions interpreted as information foci (e.g., in answers to *wh*-questions) and contrastive foci (e.g., in corrections) alike, and, vice versa, *in situ* expressions can be interpreted both as information and contrastive foci, depending on the particular context. At the same time, Hartmann and Zimmermann (2007a) show that there is a clear tendency for contrastive foci to be realized in the more marked, and less economical *ex situ* position, whereas information foci are frequently realized *in situ*.

Second, contrastive instances of focus typically exhibit special structural properties that are superimposed on the regular (information) focus marking. To begin with, instances of contrastive and information focus are marked by one and the same pitch accent (H*L) in the intonation languages English and German, but this pitch accent is frequently more pronounced on contrastively interpreted focus constituents (even though it is contested whether this difference is only gradual (Bolinger, 1961; Alter et al., 2001) or categorical in nature (Katz and Selkirk, 2009)).

Cleft sentences constitute a more transparent way of coding contrastive focus in a categorical manner, as clefted foci often cannot be used as plain information foci in answers to *wh*-questions, cf. (30) (of course, *in situ* foci can always be interpreted contrastively given the right context and – optionally – a more pronounced f_0-excursion on the pitch accent).

(30)   Q: What did Peter paint?
          A1:   #It was a BI\cycle that he painted.
          A2:   He painted a BI\cycle.

Importantly, the syntactic clefting of the (contrastive) focus constituent takes place *in addition* to regular focus marking by means of the focus pitch accent, without which the cleft constituent would not be interpretable as a focus, contrastive or not; see Delin (1992) for other information-structural functions of clefted constituents in English. Similar facts obtain for regular focus marking and focus clefting in typologically different languages like Gùrùntùm (West Chadic); see Hartmann and Zimmermann (2009).

Also notice that two additional semantic properties of focus clefts in English, namely their existence presupposition (Delin, 1992; Rooth, 1996) and the frequently observable exhaustiveness effect (Delin and Oberlander, 1995; É. Kiss, 1998), are not necessarily due to the focus status of the cleft constituent. Instead, they could be derived from independent structural properties of the *it*-cleft structure in English, and in particular by postulating a covert maximizing operator on the assumption that *it*-clefts are structurally derived from pseudoclefts (Percus, 1997). We return to the issue of exhaustiveness in section 3.3. At this point, it suffices to observe that it is intuitively unclear why it should be a notion of contrast, and not some other, independent feature that is responsible for the exhaustive interpretation of clefts – which are usually considered to constitute the clearest examples of contrastive focus.

Finally, consider an example from Bole (West Chadic). Bole consistently marks focus by realizing the focused constituent at the right edge of the verbal domain (vP), but, in addition, contrastive focus (on non-subjects) can be explicitly marked by inserting the particle *yé* before the focused constituent, as shown in (31) from Zimmermann (in press). This shows clearly that the expression of contrast in Bole is not a supra-linguistic phenomenon, but forms an integral part of the grammatical system that is optionally superimposed on the regular focus-background structure of a clause.

(31)   Q: What did Lengi do?

        A: Léngì   kàpp-ák   (yé)   mòrḍó

              Lengi   plant-PERF.F   PRT   millet

        - yé: 'Lengi planted MIL\let'.

        + yé: 'It was MIL\let that L. planted'.

Summing up, across languages, contrastive foci are frequently flagged by means of special grammatical markings that occur *in addition to* regular focus marking. The additional formal marking appears to reflect the fact that contrastive foci have a more marked interpretation, for which reason they are licit in fewer contexts. At the same time, this observation does not automatically warrant the assumption of a primitive semantic notion of *contrast* or *contrastive focus* in order to deal with such cases. Such a distinction is neither supported by clear empirical evidence, nor is it necessary for deriving the corresponding interpretive effects of contrastive focus (exclusion, exhaustiveness).

In the final part of this sub-section, we put forward a pragmatic characterization of contrastive focus that takes up the important role that (any kind of) focus plays in the updating of the common ground, and which may also provide a solution to the observation that pragmatically more marked instances of focus are typically realized by means of more marked grammatical structures across languages – albeit as a tendency, and not as a strict one-to-one correlation. As argued in Zimmermann (2008, in press), the notion of contrast refers to the fact that a particular focus content, or a particular speech act containing a focus, or a particular focus-background partition, is unexpected for the hearer from the speaker's perspective, and may thus create problems for the successful update of the common ground: since unexpected facts, or discourse moves, are more difficult to accept or accommodate, the speaker will often try to facilitate the hearer's plight of adjusting her background assumptions accordingly, which is a precondition for successful update. One possibility for the speaker to direct the hearer's attention, and to facilitate the task of shifting the background assumptions, is to use a non-canonical, i.e., a structurally more complex sentence that comes with additional grammatical marking in form of, for instance, a particular intonation contour, syntactic movement, a cleft structure, or the insertion of morphological markers.

Conceiving of contrastive focus as a discourse-semantic phenomenon that is for the most part dependent on subjective speaker judgments concerning hearer knowledge and hearer expectations directly accounts for the fact that many languages of the world allow for a (facultative) formal distinction in the realization of information focus, on the one hand, and contrastive focus, on the other. At the same time, it accounts for the observation that there is no *categorical* distinction between different focus types and different focus realizations, but only a tendency to realize pragmatically more marked contrastive foci by means of more marked non-canonical structures. Finally, this way of looking at the relation between the two basic focus types and their grammatical realization allows for another prediction with potentially universal import: cross-linguistically, if a language has two grammatical ways of realizing focus, we would not expect the more marked structure to realize instances of information focus and the less marked canonical structure to express contrastive focus; see Skopeteas and Fanselow (2009) for discussion of this point.

The (pragmatic) interpretation of particular syntactic realizations of focus by means of clefting or syntactic reordering as opposed to mere prosodic prominence is discussed for four typologically unrelated languages in Skopeteas and Fanselow (this issue), who present experimental evidence from German, Georgian, Greek and Hungarian; for Makhuwa (Bantu) in van der Wal (this issue); for Old English in Petrova and Speyer (this issue); and for Mandarin Chinese in Hole (this issue). A somewhat different but related view of contrast that takes it not as a linguistic primitive, but as a family resemblance term that covers a number of different phenomena including contrastive focus can be found in Repp (2010) and in a number of papers in the Lingua (120) special issue on "Contrast as an information-structural notion in grammar".

3.3. Additional semantic effects of focus realization

Next to the basic interpretive function of focus as facilitating the update of the common ground, there are special formal realizations of focus in many languages that give rise to additional interpretive effects. The most prominent candidate for a putative truth-conditional effect of a particular focusing strategy is the exhaustive interpretation of English *it*-clefts and the Hungarian preverbal focus position (Szabolcsi, 1981; É. Kiss, 1998). However, while the exhaustiveness effects with these focus configurations are beyond doubt (but see Onea and Beaver, 2009 for experimental evidence that the exhaustiveness effect is less strong as with exclusives) the question concerning the trigger for these effects remains subject to debate. Here, we limit ourselves to just showing that the exhaustiveness effects are not part of the asserted meaning of the corresponding sentences.

3.3.1. The meaning of it-clefts

The exhaustiveness effect typically found with *it*-clefts is illustrated in (32), from Krifka (2008), which seems to convey that nobody but Peter and John stole the cookies; see also Halvorsen (1976, 1978), Atlas and Levinson (1981), Horn (1981), Percus (1997), É. Kiss (1998), among many others.

(32)   It is Peter and John that stole the cookies.
⇒ Nobody else stole the cookies.

Crucially, the exhaustive meaning component is not part of the asserted information, but it rather comes with the flavor of some background inference (presupposition or implicature). This can be seen from the fact that focus clefts do not have the same meaning as comparable canonical clauses with the truth-functional exclusive particle *only* (Horn, 1981): in contrast to (33) with *only*, which is fine, (33) with the cleft-structure is uninformative, and hence infelicitous. This suggests that the cleft itself does not contribute to the asserted meaning of the embedded clause.

(33)   a.   I know that Marcel had a pizza,
but I just discovered that *it was **only** a pizza that he had*.
b.   #   I know that Marcel had a pizza,
but I just discovered that *it was a pizza that he had*.

The minimal pair in (34) illustrates the same point. In (34) with *only*, what the teacher regrets is the fact that only a single person passed the test, which happens to be John. In (34) with the cleft, by contrast, the reason for regret is not that only one person passed, but that this person happens to be John. This shows that the exhaustive meaning component of the cleft is not visible to the matrix verb *regret*, and, hence, that it does not form part of the truth conditions.

(34)   a.   The teacher regrets the fact that *only John* passed the test.
b.   The teacher regrets the fact that *it is John* that passed the test.

The above findings constitute clear evidence that, at least for *it*-clefts, exhaustiveness is not part of the proffered content. Because of this, *it*-clefts do not motivate the assumption of a semantic primitive *exhaustive* focus, which is sometimes also known as *identificational* focus (É. Kiss, 1998). Indeed, as already argued above, the exhaustiveness effect seems to have a different origin and may be connected to the existential presupposition triggered by *it*-clefts, as shown in (35). In this regard, *it*-clefts differ from focus as such, since, as we have already shown, focus does not trigger an existential presupposition (see section 1.2)

(35)   If it is John who kissed Mary, I will be very sad.
⇒ ∃x. x kissed Mary.

The presence of the existential presupposition points towards an analysis of *it*-clefts as derived from an underlying pseudocleft with a covert definite determiner (Akmajian, 1970; Percus, 1997). On this account, the exhaustiveness effect results from a maximality presupposition triggered by the definite determiner, such that (36) receives the interpretation in (36):

(36)   a.   The one who kissed Mary is John.
b.   ιx.[x kissed Mary] = John

In sum, adopting Percus' analysis of *it*-clefts, it is possible to derive the existential presupposition and the observable exhaustiveness effects with *it*-clefts from independent factors, without recourse to the focus status of the cleft constituent as such.

3.3.2. The meaning of Hungarian focus

As for the interpretation of Hungarian focus, É. Kiss (1998) introduced the well-known distinction between (*ex situ*) *identificational* or *exhaustive focus*, on the one hand, and (*in situ*) *information focus*, on the other.

(37)   a.   A padlón [Péter]$_{FOC}$ *aludt*.   [ex situ: exhaustive]
on the floor Peter slept.
'Peter slept on the floor, and no one else'.

b.   A padlón *aludt* [Péter]$_{FOC}$.   [in situ : non-exhaustive]
on the floor slept Peter.
'Peter slept on the floor, and possibly someone else too'

A potential source for terminological confusion comes from the fact that those instances of focus that É. Kiss classifies as information foci do not exhibit the main characteristics of information focus as laid out above. In particular, they do *not* occur in prototypical answers to *wh*-questions. Conversely, both instances of focus in (37ab) are identificational in a way, as pointed out by Kenesei (1986).

The contrast between *in situ* and *ex situ* foci that É. Kiss is interested in is not one of discourse function, or so she claims, but it is related to the variable *semantic* interpretation of the focused expressions as [+/- exhaustive]. It has often been argued that *ex situ* foci in Hungarian must be interpreted exhaustively (Szabolcsi, 1981, 1994; É. Kiss, 1998), whereas *in situ* foci are not.

As for the semantic status of the exhaustive meaning component, we would like to stress the fact that – contrary to common opinion originating with Szabolcsi (1981) – the exhaustive meaning component provided by preverbal *ex situ* focus in Hungarian does *not* affect the asserted content, but may possibly come about as a presupposition. Same as with *it*-clefts, the meaning of preverbal *ex situ* foci in Hungarian is not identical to the meaning of foci with the exclusive particle *csak* 'only' (Szabolcsi, 1994). The interpretations of the sentences in (38) are identical to those of their English *only*- and cleft-counterparts in (34).

(38) a. A tanár sajnálja, hogy csak [Johnnak]$_{FOC}$ sikerült a teszt.

The teacher regrets that only to John succeeded the test.

The teacher regrets the fact that only John passed the test.

   b. A tanár sajnálja, hogy [Johnnak]$_{FOC}$ sikerült a teszt.

The teacher regrets that to John succeeded the test.

The teacher regrets the fact that it is John that passed the test.

Based on such parallels between *it*-clefts and Hungarian *ex situ* foci, Kenesei (1986, 2006) and Szabolcsi (1994) have proposed an analysis of the exhaustive interpretation of Hungarian focus along the lines in (36), i.e., as resulting from the interaction of an identity statement and a maximality presupposition.

More recently, though, the classification of Hungarian focus types on the base of their (non-) exhaustiveness has been questioned both on theoretical and on experimental grounds by Wedgwood (2005) and Onea and Beaver (2009). Onea and Beaver (2009), in particular, argue that the exhaustive interpretation of preverbal *ex situ* foci in Hungarian is not coded in the grammatical structure, but rather relates to the fact that the use of a preverbal focus is the standard way of expressing answers to *wh*-questions in Hungarian. In light of this, the observed exhaustiveness effects may simply follow from a generalized conversational implicature, which is due to the fact that answers to *wh*-questions are assumed to be complete in the default case (Schulz and van Rooij, 2006).

Importantly, whether or not the exhaustiveness effects observed with particular focus realizations turn out to be a matter of semantics or pragmatics, the notion of exhaustiveness is inextricably linked to the presence of alternatives (Horvath, 2010). Given this, we do not exclude the possibility that natural languages may grammaticalize formal markers of exhaustiveness that are by necessity related to the focus of the utterance, as argued for Hungarian in Horvath (2010). Such strategies of expressing exhaustiveness need not be restricted to syntactic movement, as in Hungarian, but they may also involve the use of special morphological markers, such as the particle *nee/cee* in Hausa (Green, 1997; Hartmann and Zimmermann, 2007c), cf. (39).

(39) *À kân   teebùr   (#nee)   su-kà   sâ   lìttàttàfai,   [Green, 1997:20]*

   upon   table   PRT   3PL-REL.PERF   put   books

   dà   kuma   cikin   àkwàatì.

   and   also   inside   box

   They put the books on the table (#nee), and also inside the box.'

The notion of exhaustiveness also plays an important role in most contributions of this special issue. Skopeteas and Fanselow investigate exhaustiveness inferences associated with particular syntactic configurations in German, Georgian, Greek and Hungarian. Petrova and Speyer discuss the correlation between particular syntactic movement operations in Old English and exhaustiveness inferences. Hole proposes a semantic analysis for *shi... de*-clefts in Mandarin Chinese in which the focused constituent receives an exhaustive interpretation due to the presence of a (definite) event determiner. And van der Wal proposes a related, but weaker notion of *exclusive focus* in her analysis of focus marking in Makhuwa (Bantu).

4. Conclusion

In this introductory article we have put forward a particular way of thinking about focus as a universal information-structural category that comes with a unified core function of evoking alternatives. The focus alternatives assist in ranking a certain subset of possible worlds as higher, and hence more relevant for the interpretation of a given utterance, depending on the preceding context. Depending on how this subset of privileged possible worlds is exploited in the actual (pragmatic)

interpretation of an utterance, we can distinguish between different pragmatic focus types, which may or may not be formally marked in a special way in natural languages. The most natural cross-linguistic, and possibly universal, candidates for focus types in need of additional formal marking seem to involve the notions of contrast and exhaustiveness.

In addition we have raised two important questions that are addressed in the contributions of this special issue. First, how do alleged grammatical markings of focus actually relate to the information-structural category of focus? Second, how do different types of formal focus marking influence the interpretation of focus? Concerning the first question, we have presented two crucial observations: first, there is no one-to-one correlation between focus and its formal marking; and second, because of this, there is a large degree of underspecification at the interface between information-structure and the grammatical modules as such. This issue is addressed in detail by Beaver and Velleman (this issue) for the interface between information-structure and prosody. The second issue directly relates to the notions of contrast and exhaustiveness and is addressed by all other contributions.

Acknowledgements

Appendix A

See Diagrams A1 and A2.

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