Focus Triggers and Focus Types
from a Corpus Perspective

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Abstract

The article discusses several issues relevant for the annotation of written and spoken corpus data with information structure. We discuss ways to identify focus top-down (via questions under discussion) or bottom-up (starting from pitch accents). We introduce a two-dimensional labelling scheme for information status and propose a way to distinguish between contrastive and non-contrastive information. Moreover, we take side in a current debate, claiming that focus is triggered by two sources: newness and elicited alternatives (contrast). This may lead to a high number of semantic-pragmatic foci in a single sentence. In each prosodic phrase there can be one primary focus (marked by a nuclear pitch accent) and several secondary foci (marked by weaker prosodic prominence). Second occurrence focus is one instance of secondary focus.

Keywords: alternatives, contrast, corpus annotation, focus, givenness, information status, information structure, prosody, question under discussion, secondary prominence

1. Focus in English and German: basic prosodic assumptions

The purpose of this article[1] is to discuss the notion of *focus* – which has been intensively investigated in the theoretical and experimental literature – in the light of corpus data. For this, it is necessary that we take a stand on a number of issues about which the current theoretical debate is undecided, for instance, whether one or several types of focussing should be assumed and how to delineate contrastive from non-contrastive focus. We are convinced that precision with regard to conceptual issues is an indispensable prerequisite for corpus annotation of information structure. We will furthermore argue in favour of a distinction between what we call *primary focus* and communicatively less important kinds of *secondary focus*.

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1. This is a completely revised and extended version of an article which occurred in 2011 under the title *Information Structure Annotation and Secondary Accents* in the volume *Beyond Semantics: Corpus-based Investigations of Pragmatic and Discourse Phenomena* in the series *Bochumer Linguistische Arbeitsberichte,* 3:111-127, ed. by Stefanie Dipper and Heike Zinsmeister.

The first assumption which we shall make in this paper is that in English or German,[2] and presumably in other languages, there can only be one major or *primary* focus per prosodic phrase – marked by means of a nuclear pitch accent. Let us call this the *unique primary focus hypothesis*. This immediately requires some specification: in line with most current theoretical treatments, we take focus to be a semantic-pragmatically – and not prosodically or morpho-syntactically – defined notion. To investigate what the precise semantic-pragmatic factors are which lead to focussing is one of the main subjects of the present article, and we will soon turn to this issue. Therefore, for the time being, let us assume that there is a theoretical possibility of two pragmatically induced foci sharing the same prosodic phrase. In such cases we shall assume that only one of these can become the primary, and perceptually most important, one. Apparent counterexamples to this claim are given in examples (1) to (4).

(1)   Even JOHN$_{F1}$ drank only WAter$_{F2}$.   (Krifka, 1992)

(2)   A: Did Carl sue the company, or did the company sue Carl?   (Büring, 2003)
       B: CARL$_{F1}$ sued the COMpany$_{F2}$.

(3)   A: Who ate what?   (Roberts, 1996; Büring, 2003)
       B: FRED$_{F1/CT}$ ate the BEANS$_{F2}$.

(4)   In MY$_{F1/T}$ opinion, JOHN$_{F2}$ stole the cookies.   (Krifka, 2008)

The phenomenon in (1) has been called *multiple focus*, triggered by the presence of two focus-sensitive particles, *even* and *only*, within the same sentence. In (2B), the two foci highlight a choice of a pair of contrastive alternatives from among the two pairs provided by question (2A). (3B) is a protoypical example involving a *contrastive topic*, which is widely assumed to share basic properties of focus, in particular, the ability to induce an alternative set. Other than (2B), it additionally signals that the question is not answered completely and that *people*, rather than *dishes*, are the "sortal key" (Büring, 2003: 530) along which (3A) is worked off. The first focus in (4) is used within a *frame-setting topic*, which likewise divides the interpretational space into alternative partitions. Ignoring the fact that the pitch accents occurring on the two focal elements might be of a different type, e.g. rising vs. falling, there is no clear observable difference with respect to their prosodic strength or prominence.[3] This holds true for all four examples.

As we said, however, this is only an apparent contradiction to the *unique primary focus hypothesis*, since it is likely that in all cases mentioned, the two respective foci are confined to their own intermediate phrase (ip) – or even intonation phrase (IP) – defined by Beckman et al. (2005) as the domain for a nuclear accent. In other words, the prosodic structure of all sentences in (1) to (4) will look like (5).

(5) $\{\{ \text{(PN}_1 \ldots \text{PN}_n) \, \mathbf{N} \, \text{(pn) -}\}_{ip} \{ \text{(PN}_1 \ldots \text{PN}_m) \, \mathbf{N} \, \text{(pn) -}\}_{ip} \, \%\}_{IP}$

Here, PN stands for an optional prenuclear accent, several of which may occur, **N** is the nuclear pitch accent, and pn stands for optional postnuclear prominence. The latter is not supposed to carry

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2. Throughout the paper, we shall make the assumption that the prosodic marking of information structure is very similar in English and German. This seems by and large justified with regard to pitch accent placement, but perhaps less so with regard to some details of pitch accent types.

3. Note that Krifka (2008) *does* claim that the first accent in some cases of multiple focus is stronger than the second one, and that this distinguishes *multiple focus* from *complex focus*. If this holds true in general, then (1) is no counterexample to the unique primary focus hypothesis in the first place.

the rank of a pitch accent and is signaled by means of increased duration and intensity but only very little pitch movement – *phrase accent* (Grice et al., 2000), or *postlexical stress* (Beckman, 1986). Furthermore, '%' indicates an intonation phrase break, and '-' stands for an intermediate phrase break.

However, it is possible and, as we shall argue, widespread to have several foci in the same prosodic phrase. One particular case in point is *second occurrence focus (SOF)*, which has received a considerable amount of attention in recent years, e.g. Rooth (1996); Partee (1999); Bartels (2004); Büring (submitted); Rooth (2010); Beaver and Velleman (2011), though not explicitly from the perspective of prosodic phrasing. A well-known example from Partee is shown in (6), in which we would assume that the first half of (6b) (until *vegetables*) can be realised as a single prosodic phrase.

(6)   a.   Everyone knew that Mary only eats **VE**getables$_{F1}$.
       b.   If even **PAUL**$_{F2}$ knew that Mary only eats VEgetables$_{SOF}$,
             {   **N**   pn   -}
             then he should have suggested a different restaurant.

Several experiments on both English (Rooth, 1996; Beaver et al., 2007) and German (Féry and Ishihara, 2009; Baumann et al., 2010) have revealed that (semantically) focussed but given expressions, like *vegetables* in (6b), can be realised with some sort of postnuclear prominence (pn), thus differing from non-focal, given expressions, which are completely deaccented. We will return to the issue of second occurrence focus in Section 5.

At this point, we would like to draw the reader's attention to a related phenomenon which has received much less attention than the role of postnuclear prominences in marking second occurrence focus: the information structural contribution of prenuclear accents. While it is easy to ignore these accents when discussing "the" focus of constructed examples, they represent an important and ubiquitous element of the prosody of almost every spoken utterance. Consider the phrase shown

Figure 1: 'in the former slave trading post Elmina' (DIRNDL: s1222, 26-03-2007, 06:00, 7'12")

in Figure 1, taken from the DIRNDL corpus of German radio news (Eckart et al., 2012), which is annotated for pitch accents and prosodic boundaries following GToBI(S) (Mayer, 1995). The entire sentence is given in (7).

(7)   In **GHA**na   fand ein **FEST**akt   im Ehemaligen ꜱᴋʟᴀven-Handelsposten El**MI**na statt.
        {{ L*H   -} {   L*H   -} { H*   L*H   H*L   %}}
        In Ghana, a ceremonial act took place in the former slave trading post Elmina.

In the section shown in Figure 1 there are two prenuclear accents, H* on the adjective *ehemaligen* ('former') and L*H on *Sklaven-Handelsposten* ('slave trading post'). It is accents like these which are usually ignored in formal discussions of focus. If they are mentioned at all, they are often assumed to be optional or, at least, not meaning-related.[4] We would like to raise doubts about the optionality of prenuclear accents. In (7), it doesn't seem possible to omit any of the prenuclear accents. It is unclear, so far, whether this is because they play a role in indicating information structure – perhaps marking a focus of their own – or for purely rhythmical reasons. It seems that in order to settle this issue, more theoretical background is necessary.

Analysing corpus data with regard to their focal properties raises a number of problems. We may by now have sophisticated theories concerning the pragmatics of focus, as well as good experimental evidence about its prosodic marking. Nevertheless, all that knowledge still seems quite insufficient to analyse even a relatively simple and by no means untypical example like (7). In the next section, we will try to sketch the problem from two different perspectives (top-down, i.e. from the perspective of questions under discussion, and bottom-up, i.e. starting out from pitch accents) and show that there are still some problems with the determination of focus in corpus data. Of course, the notions *primary focus* and *secondary focus* are not purely pragmatic since their definition makes reference to prosodic concepts.[5]

In Section 3, we demonstrate our RefLex annotation scheme for given, accessible and new information (information status), which accounts for a less controversial, though substantial, share of the information structure of linguistic data. Section 4 discusses the distinction between noncontrastive and contrastive focus and presents a method of how to spot contrastive (alternative-eliciting) features in corpus data. In Section 5, we return to the issue of primary and secondary foci.

2. Determination of focus: top-down vs. bottom-up

Taking another look at example (7), we may find it surprisingly difficult to tell how many foci it contains. The simplest choice is to say that the entire sentence represents a single broad focus. An obvious justification is that (7) contains only discourse-new information, and therefore serves to answer the Big Question (Roberts, 1996) *What is the way things are?*, or simpler *What happened?*

For several reasons this cannot be a satisfactory solution. As it is known from the work of Groenendijk and Stokhof (1984) and Roberts (1996), assertions need not be complete answers; in fact, an unrestricted question like *What happened?* is never answered completely. But if an answer

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4. Büring (2007) calls these accents "ornamental".

5. Note that Büring (submitted) gives a purely pragmatic definition of *primary focus* in terms of the sizes of *focus domains*. Of two foci, the one "whose domain contains the domain of the other" is the primary one. Büring predicts that this focus will then receive the nuclear pitch accent. Since we do not assume that the problem of identifying focus domains in natural language data has been solved we do not currently make use of Büring's definition.

is only partial with regard to the Big Question, as is the case with (7), it may carry additional information about the structure of the conversation. According to Roberts, the prosody of assertions reflects the (immediate) *question under discussion (QUD)*, which is more specific than the Big Question and usually implicit. Büring (2003) develops this idea further, elaborating on example (8).

(8)   FRED$_{CT}$ ate the BEANS$_F$.

Consider (8) as a discourse-initial assertion. The *contrastive topic* in (8), marked by a rising accent on *FRED*, signals the *discourse strategy* of the speaker to answer the question *Who ate what?* by first providing an answer to the subquestion *What did Fred eat?* Our German corpus example (7) shows – perhaps incidentally[6] – a very similar pattern at the beginning. It is in accordance with our interpretation of the sentence to assume that (7) has an analogous structure to (8), i.e. a contrastive topic on the phrase *in Ghana*; in other words, (7) seems to signal a strategy – technically a stack – consisting of the two implicit questions (i) *What happened where?* and (ii) *What happened in Ghana?* We infer that the speaker intends to continue, at some stage, with news about other countries.[7] If *in Ghana* is indeed a contrastive topic (and therefore, a special kind of focus), and if the remainder of the clause is the main focus which actually answers question (ii), then the total number of independent focal constituents in the sentence rises to at least two.

Determining the focal structure of some utterance in the way described – by reasoning about implicitly asked questions – is what we might call a *top-down* process of focus identification: first, determine what is being asked for, or under discussion, and whether it is part of a discourse strategy; second, identify the phrases which provide an answer to the question under discussion; and third, predict or observe how these phrases are marked prosodically (and/or morpho-syntactically).[8] In other words, the marking itself should not be used to identify the focus or the contrastive topic. We do not claim that we already possess a universal procedure which lives up to these standards. The top-down approach works straightforwardly in simple cases like (9), in which the accented word JOHN is both the focus and the answer to the QUD.

(9)   a.   Who spilled the wine?
        b.   JOHN$_F$ spilled it.

The procedure can also be applied to more complex cases involving nested phrases and disjoint foci. (10) is a German example from Höhle (1982), discussed in Gussenhoven (1999).

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6. Note that we do not propose to rely on the actually found pitch accents to guide us in the annotation process. We are not claiming that a rising pitch accent necessarily signals a contrastive topic. Clearly, contrastive topics need to be identified via pragmatic reasoning. What we hope to eventually find, however, is statistical evidence in the prosodic domain that supports the chosen pragmatic analysis.

7. It must be noted though that intentions like this are often not more than vague promises, and that strategies may fall prey to memory decay. This goes against Roberts' assumption that questions have to remain on the QUD stack until resolved or determined unanswerable. Another conceivable situation is that a person reading a text simply has a false anticipation of what is to follow.

8. As is well-known, some languages do not mark a focus by means of prosodic prominence. Other devices found cross-linguistically include moving the focal constituent to a particular syntactic position in the sentence, or attaching a special focus morpheme.

(10)   A: Was hat das Kind erlebt?
         What happened to the child?
         B: KARL$_F$ hat dem Kind [einen FÜLler geschenkt]$_F$.
         Karl gave the child a fountain pen.

The phrase which provides the answer to the question under discussion – i.e. the focus – is split in two parts, *Karl* and *einen Füller geschenkt*. Gussenhoven (1983, 1992, 1999) offers a general rule for predicting the accent pattern of a focus that has been pragmatically determined, the so-called *Sentence Accent Assignment Rule (SAAR)*, which we reproduce here in a simplified form:

1. Place a pitch accent on every content word in focus.

2. Then, deaccent every focussed predicate which is adjacent to an accented argument.

The SAAR correctly predicts the pitch accents on *Karl* and on *Füller* ('fountain pen'), the lack of pitch accent on the backgrounded (i.e. unfocussed) word *Kind* ('child') and the deaccenting of the predicate *geschenkt* ('given').[9] As for example (7), we already assumed that the focus encompasses the phrase in (11).

(11)   [fand ein **FEST**akt im Ehemaligen SKLAvenhandelsposten El**MI**na statt]$_{F?}$

Again, the SAAR correctly accounts for the deaccentuation of *fand…statt* ('took place') which is adjacent to its argument *ein Festakt* ('a ceremonial act'). The remaining content words receive a pitch accent because they do not stand in any predicate-argument relation.

What Gussenhoven's rule cannot accomplish is to explain the intricate patterns of prosodic phrasing. Neither does it tell us whether the focus in (11) is a single one or whether it actually consists of several smaller foci. In order to answer this question, we return to Roberts' (1996) theory of *questions under discussion*. When answering question (12a) by means of (7), we are actually behaving in an over-informative way. In some sense, it would have been enough to use the simpler answer given in (12b).

(12)   a.   What happened in Ghana?
         b.   [In GHAna]$_{CT}$ [fand ein FESTakt statt]$_F$.

(13)   im ehemaligen Sklavenhandelsposten Elmina

In fact, the over-informative prepositional phrase in (13) is a non-restrictive modifier and therefore belongs to the class of so-called *supplemental expressions*, which Potts (2005: 6) defines as *conventional implicatures* or as *not-at-issue*. Simons et al. (2010) define *at-issueness* by saying that a proposition p is at-issue if and only if the question whether p is true or not entails an answer to the QUD. In our case, the proposition expressed by the PP, namely *The location of the ceremonial act is in Elmina*, is not an answer to (12a), but rather to the supplemental question in (14).

(14)   *Where did the ceremonial act take place?*

In fact, we can iterate this process once more by stating that the information that *Elmina is a former slave trading post* – the meaning expressed by the non-restrictive modifier of Elmina – is not an answer to (14) but to (15).

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9. Deaccentuation of a predicate with an accented argument is explained in a similar fashion within Selkirk's (1984,1995) *focus projection* framework.

(15)   *What is Elmina?*

This, admittedly complex, line of reasoning brings us to the following tentative conclusion: it is very likely that our corpus sentence actually consist of *four* independent pragmatic foci (including one contrastive topic), as shown in (16).

(16)   [In **GHA**na]$_{CT}$ [fand ein **FEST**akt   [im [Ehemaligen SKLAvenhandelsposten]$_{F3}$
         {{ **L*H** -}   {   **L*H**   -} {   H*   L*H
         El**MI**na]$_{F2}$ statt]$_{F1}$
            H*L   %}}

We can furthermore state that CT, F1 and F2 are marked by nuclear pitch accents – in the terminology defined in the previous section, they represent *primary foci*. F3 is only marked by (two) prenuclear accents; we therefore call it a *secondary focus*.[10]

The top-down approach, as we have sketched it, has two important advantages: it is cross-linguistically applicable, even to languages which do not mark information structure prosodically, and it does not confuse form (pitch accent) and meaning (focus). The problem is that the identification of QUDs in corpus data is still in its infancy, and the current paper does not purport to propose a general procedure for it, although this is what clearly should be envisaged in the future.

A competitor to the top-down approach, which is intrinsic to certain well-established theories of focus, including Rooth (1992) and Selkirk (1995), is the assumption that pitch accents necessarily indicate a focus.[11] We call this the *bottom-up* approach to focus identification. Obviously, the bottom-up approach is not linguistically universal, and even for English or German we cannot be entirely sure whether the assumption is empirically sound, especially if secondary prominence comes into play. Note that, under the bottom-up approach, example (16) would not contain four focal expressions but five, since the prenuclear pitch accent on *ehemaligen* would count as an autonomous marker of focus.[12] Nevertheless, at the current stage, we cannot entirely do without the bottom-up approach as long as the top-down approach is not fully worked out. This will become clear in Section 4, when we will discuss whether an observed nuclear pitch accent is used to express contrastive focus or not.

In the following Sections, we will discuss those aspects of information structure which we think can be annotated without too much controversy. This will enable us to create pragmatically enhanced corpus resources, which may subsequently serve as a basis for empirical investigation, even though we currently do not claim to annotate all aspects of *focus* itself. For other proposals of annotating information structure – which we are not going to discuss – see e.g. Hajičová et al. (2000), Paggio (2006), Götze et al. (2007), or Cook and Bildhauer (this volume).

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10. In another terminology, inspired by Potts (2005), we might call F1 an *at-issue focus*, and F2/F3 *not-at-issue foci*.

11. Quote Selkirk (1995: 555): "The Basic Focus Rule states that the assignment of a pitch accent to a word entails the F-marking of the word[.]"

12. Note that leaving out the H* accent on *ehemaligen* would presumably violate the *givenness principle* (Schwarzschild, 1999), which says that an expression must either be given or F-marked. Focus projection rules (Selkirk, 1995) do not allow an F-marker to project from *Sklavenhandelsposten* since it is not an argument of *ehemaligen*. Therefore, the adjective needs its own pitch accent.

3. Annotating given-new information: the RefLex scheme

In accordance with our discussion in Section 2, we adopt a definition of focus in terms of answers to explicit or implicit questions. This is not an uncontroversial decision. Often, what counts as the answer to an implicit question can simply be called *new information*. However, not everybody seems to agree that new information which is not otherwise marked (e.g. occurring in a contrastive constellation or being associated with a focus-sensitive particle) deserves to be called focus. Consider the following quote by Elisabeth Selkirk:

> *[. . .] I am using the simple term "focus" to refer to "contrastive focus" [. . .], as involving Roothian alternatives. This should not be confused with the use of the term "focus" to indicate newness in the discourse, a use which this paper argues should not be made.* (Selkirk, 2008: Section 4, Footnote 9)

We agree with Selkirk's view that there is a linguistically relevant distinction between contrastive focus and (purely) new information in terms of their pragmatic meaning (more on this in Section 4). Besides, as Selkirk and numerous others have shown in their work, contrastive focus tends to receive higher prosodic prominence and sometimes uses syntactically less canonical structures than new information, cf. Repp (2010) and references therein. However, we object against Selkirk's conclusion that newness should not be called focus. In Section 4 we will account for the distinction between contrastive and non-contrastive (novelty) focus in a way that is compatible with Rooth (1992). The common denominator of new and contrastive constituents is their ability to answer questions – to reduce the number of possibilities the world might be like – and this is what should be taken as the defining characteristic of focus in general.

In Section 2 we gave a sketch of the top-down analysis of the focal structure of natural discourse, not yet ready for the use in linguistic annotation. In this section, as a first step towards the annotation of focus we are going to provide a scheme for annotating (different types of) given and new (as well as accessible) information, what is also called *information status*, following the system of Baumann and Riester (2012). The scheme combines earlier accounts of information status in the aftermath of Prince (1981) – notably Chafe (1994); Lambrecht (1994); Eckert and Strube (2000); Nissim et al. (2004); Götze et al. (2007); Riester et al. (2010) – with the *givenness* theory by Schwarzschild (1999). To classify the constituents of a sentence into given and non-given ones is a move towards identifying its background-focus structure. Schwarzschild's *givenness principle* says that non-given constituents must be "F-marked" (and are therefore, in some sense, focal).[13] Our procedure will not tell us how many different foci a sentence contains. But it will provide us with a fine-grained analysis with a view to its prosodic correlates; see Baumann and Riester (to appear).

The system distinguishes between a referential level and a lexical level (and is therefore called the *RefLex* scheme). We will clarify why it is desirable to use such a fine-grained system rather than just distinguishing between "given" and "new" constituents. Note well that we are not claiming that the annotation labels presented below represent syntactic features of some kind, in the way as, for instance, Selkirk (2008) treats her *F* and *G* markings. We will make no predictions as regards the precise functioning of the syntax-phonology interface. The category descriptions below are deliberately kept short, since we have introduced them in great detail elsewhere (Baumann and Riester, 2012).

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13. Beaver and Clark (2008: 15) notice that there are several usages of the F-marker in the literature.

3.1 R-GIVEN and L-GIVEN

Givenness, loosely following Schwarzschild (1999: 151), can be interpreted as either synonymy / hyponymy of lexemes (and the concepts they express), or as identity between referring expressions. Likewise, Halliday[14] distinguishes between *lexical cohesion* and various referential relations. We call the two notions L-GIVENNESS and R-GIVENNESS, respectively. Interesting constellations can be observed if the two notions are simultaneously applied, as shown below.

By use of the choice of R-categories it is possible to classify *referential* determiner phrases and prepositional phrases occurring in natural discourse; by use of the L-categories we can classify the information status of content words and non-referential phrases. R-labels apply at the DP or PP level. For instance, in examples (17), (18) and (20) we find various kinds of coreferential expressions. Lexical givenness, on the other hand, applies in (18) and (20) on the repeated words, and in (19) on the hypernym *man*.

(17)

A colleague came in.	The	idiot	dropped a vase.
		R-GIVEN	

(18)

A student came in.	Another	student	greeted	him.
		L-GIVEN		
				R-GIVEN

(19)

A policeman came in.	Another	man	left.
		L-GIVEN	

(20)

A man came in.	The	man	coughed.
		L-GIVEN	
	R-GIVEN		

The most important take-home message is that neither is referential givenness a prerequisite for lexical givenness, as shown in (17), nor the other way round, see (18) and (19), although the two sometimes combine, as in (20).

3.2 R-NEW, L-NEW, R-UNUSED

Novelty is, on most treatments of information structure and discussions of the given/new distinction, understood as "novelty in the discourse". Remarkably, however, Prince (1992) additionally distinguishes between *discourse novelty* and *hearer novelty*, the latter representing a stronger notion since unmentioned (i.e. discourse-new) entities may nevertheless be familiar to the addressee (i.e. hearer-old). In her earlier paper, Prince (1981) uses the labels *unused* (discourse-new, hearer-old) and *brand-new* (discourse-new, hearer-new) for the same opposition. The labels R-NEW and R-UNUSED that are employed on our account are defined in a slightly different way: both describe discourse-new referential expressions but, while R-NEW is reserved for indefinites, R-UNUSED stands for uniquely identifiable, definite, but not necessarily *known*, entities used on the first occasion in a text. This decision, on the one hand, does justice to the long-standing semantic tradition to keep indefinites and definites (for instance, proper names) apart, and, on the other hand, accounts for the difficulty to decide with certainty whether, for instance, a *named entity* is hearer-known or not, cf. Riester et al. (2010).

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14. E.g. Halliday and Hasan (1976: 288)

Independently of what has just been said, it is furthermore possible to separately describe the discourse novelty of *lexemes* (L-NEW) and of the *discourse referents* (R-NEW, R-UNUSED) which they introduce. Examples of the three categories in combination are given in (21) to (23).

(21)

A	man	came in.	Another	man	left.
	L-NEW			L-GIVEN	
R-NEW			R-NEW		

(22)

George	came in.	Mary	likes	George.
L-NEW		L-NEW		L-GIVEN
R-UNUSED		R-UNUSED		R-GIVEN

(23)

The	man	who stole	my	wallet	is very tall.
	L-NEW			L-NEW	
			R-UNUSED		
R-UNUSED					

The complex subject phrase in example (23) shows that information status needs to be assigned recursively. This is an issue which is of particular relevance for the language of news, which contains many expressions with several embeddings, cf. Riester et al. (2010).

3.3 R-BRIDGING, L-ACCESSIBLE

Prince (1981) and also Chafe (1994) have pointed out that it is desirable to not only distinguish between *given* and *new* information but to take into account at least a third, intermediate, class: expressions which have not been mentioned explicitly but are *inferrable* from material in the discourse. Chafe (1994) uses the term *accessible* for such information but does not distinguish between different levels, as we would like to do. As far as discourse referents are concerned, a closely related phenomenon has been discussed under the notion of *bridging* or *associative anaphora* (Clark, 1977; Asher and Lascarides, 1998; Löbner, 1998; Poesio and Vieira, 1998), shown in example (24).

(24)

Bill	discovered	a romantic	house.	The	door	was open.
L-NEW			L-NEW		L-ACCESSIBLE	
R-UNUSED		R-NEW		R-BRIDGING		

The label L-ACCESSIBLE is defined for words which are hyponyms or meronyms (part expressions) of other words in the recent discourse context (i.e. not further away than 5 clauses). The label R-BRIDGING, on the other hand, is defined quite differently as a definite expression whose licensing depends on a previously introduced scenario or frame. So, while in (24), *house* and *door* stand in a whole-part relation (*door* is lexically accessible), no such relation exists between *murdered* and *harpoon* in (25). Since the harpoon is an unusual murder instrument, it is labeled L-NEW. Nevertheless, we would still like to say that this is a case of bridging, since the second sentence could not be uttered felicitously at the beginning of a discourse.

(25)

John	was murdered yesterday.	The	harpoon	was lying nearby.
L-NEW			L-NEW	
R-UNUSED		R-BRIDGING		

Other than in the case of R-UNUSED expressions, the interpretation of items labeled R-BRIDGING is context-dependent. In contrast to the label R-GIVEN, R-BRIDGING implies non-coreference. Indefinites never receive the label R-BRIDGING in the present system. In (26), lexical accessibility combines with referential novelty.

(26)

John	lives	in	Italy	and is married	to a	Neapolitan.
L-NEW			L-NEW			L-ACCESSIBLE
R-UNUSED			R-UNUSED			R-NEW

3.4 R-GENERIC

Definite or indefinite expressions which refer to a kind, see (27) and (28), receive the label R-GENERIC.

(27)

The	lion	has	a	mane.
	L-NEW			L-NEW
R-GENERIC			R-GENERIC	

(28)

Mary	likes	vegetables.	John	likes	vegetables,	too.
L-NEW		L-NEW	L-NEW		L-GIVEN	
R-UNUSED		R-GENERIC	R-UNUSED		R-GENERIC	

As can be seen in (28), we do not treat the repeated mention of a generic expression *(vegetables)* as a case of coreference (R-GIVEN) but merely as repetition of the same concept (L-GIVEN, R-GENERIC).

3.5 Overview and annotation of higher syntactic constituents

Table 1 contains the most important labels of the RefLex annotation scheme. For a comprehensive list of labels consult Baumann and Riester (2012). In the following, we will turn to a number of practical issues which arise when we apply the annotation scheme to corpus data. As we said at the beginning of this section we want to use our annotation system in order to arrive at a comprehensive identification of the given and non-given parts of linguistic data since we consider the latter as indicating focal material. In order to achieve this goal we cannot confine our analysis to referring expressions, as it has been done in e.g. Prince (1981); Nissim et al. (2004); Götze et al. (2007); Riester et al. (2010), but need to extend the annotations to other content expressions like adjectives, verbs and adverbs as well as their syntactic projections. The account builds upon Schwarzschild's (1999) theory of focus and givenness. Of course, the question what counts as a unit for annotation is influenced by the choice of syntactic theory underlying the analysis. A principled distinction can be made between expressions which refer to some entity, like an individual, a place, a fact etc. (DP, PP, *that*-CP),[15] and expressions which denote a property / set of entities (NP, AP, VP, AdvP, IP) or a

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15. One reviewer criticised that PPs should count as properties rather than individual type entities, which is a common assumption in semantics. What we are after, however, is the *referent* of an argument, which often comes in the form of a PP. Sometimes PPs refer to a place or time; sometimes the preposition is subcategorised by the predicate and semantically empty; sometimes, in German, preposition and determiner are amalgamated (*im, zum* etc.) In all those cases the simplest practical choice is to assign referential information status to the PP. A second criticism pertained to allegedly non-referential quantifiers like *few people, every dog*. In corpus data, however, such expressions *almost always* introduce or refer back to group entities, analogously to indefinites and definites.

R-Level		L-Level	
Units: DP, PP, *that*-CP		Units: AP, AdvP, NP, VP, IP	
Label	Description	Label	Description
R-GIVEN	corefential anaphor	L-GIVEN	word identity / synonym / hypernym / holonym / superset
R-BRIDGING	non-coreferential context-dependent expression	L-ACCESSIBLE	hyponym / meronym / subset / co-hyponym / related
R-UNUSED	definite discourse-new expression	L-NEW	unrelated expression (within last five clauses)
R-NEW	specific indefinite		
R-GENERIC	generic definite or indefinite		
OTHER	e.g. cataphors		

Table 1: Overview of basic *RefLex* scheme
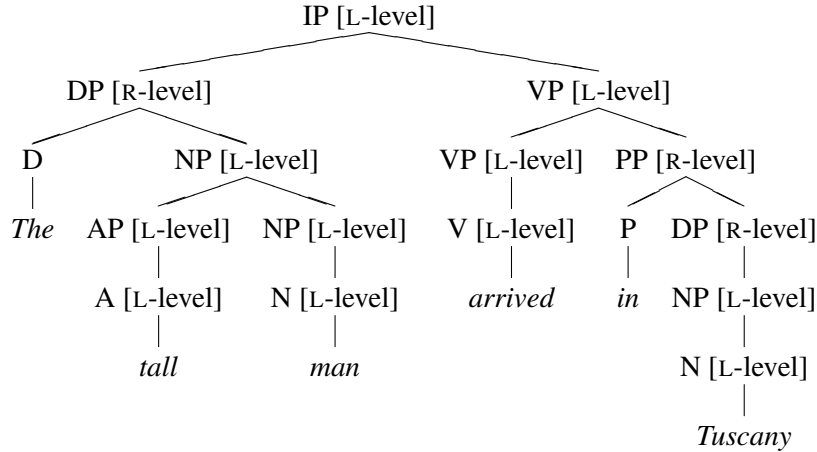
Figure 2: Basic target units for *RefLex* annotations

relation.[16] As is shown in Figure 2, the former are assigned R-labels, the latter L-labels (in practice, some of these labels will be redundant and can be left out).

What we are proposing amounts to a practical explication – and further development – of the approach taken by Schwarzschild (1999: 151), who distinguishes between categories of type e (R-level) and of type $\langle \alpha, \beta \rangle$ (L-level). Our definition of the L-level, however, is much simpler than Schwarzschild's since we completely abandon his notion of *Existential F-closure*. However, we

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16. We assume the DP hypothesis (Abney, 1987). Accordingly, we take NPs to denote properties, i.e. sets of individuals, whereas DPs denote (or refer to) a single individual or group entity. We furthermore make use of a variant of syntactic analysis which assigns main clauses the category IP (inflection phrase). By this, we ignore more detailed analyses of this level in terms of aspect, tense and voice, compare e.g. Adger (2003).
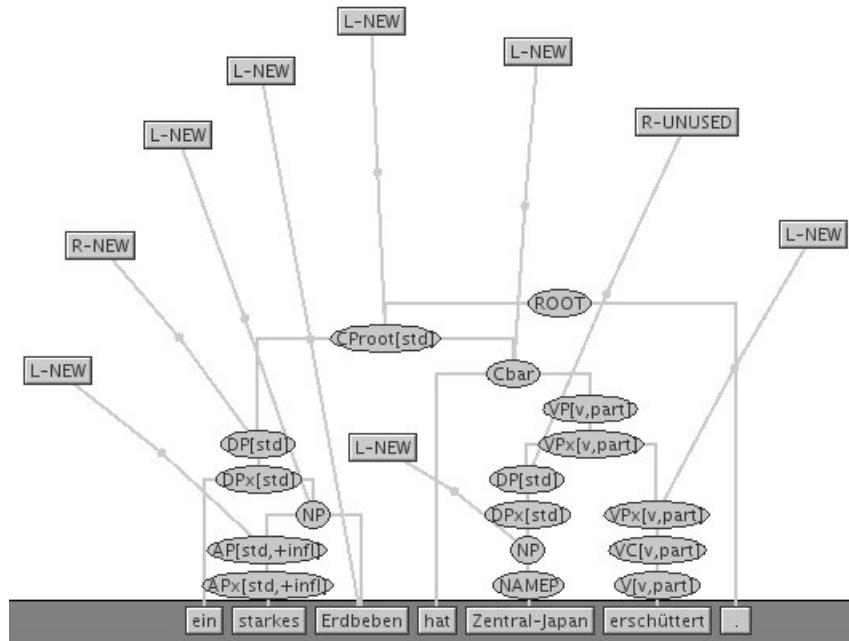
Figure 3: Sentence annotated in SALTO: *A strong earthquake has hit central Japan.* (DIRNDL s165, 25-03-2007, 5:00)

make use of his idea to generalise lexical relations to a notion of entailment.[17] In corpus annotation practice, the system will have to be adapted to various constraining factors, such as the properties of the chosen parser with its specific syntactic tagset, as well as features of the annotation tool. Figure 3 shows the annotation of a German sentence from the DIRNDL corpus (Eckart et al., 2012), which was parsed using XLE and the German LFG grammar by Rohrer and Forst (2006), and converted to be used with the SALTO tool (Burchardt et al., 2006), which produces output in TIGER/SALSA-XML. In the rest of the paper, we shall abstract over such individual choices, since it is our goal to provide the general annotation procedure and not one that is tied to a specific annotation tool, format or syntactic theory.

In the following, we will briefly show how the extended annotations can be applied to an example from a German radio news bulletin. Example (29) has been slightly adapted for ease of demonstration. The analysis is shown in (30) to (32), using a simplified table notation. Note that in our envisaged annotation process of information status, the labellers will have no access to prosodic information.

(29) a. Ein starkes Erdbeben hat Zentral-Japan erschüttert.
          A strong earthquake has hit central Japan.
      b. Die Behörden gaben eine Tsunami-Warnung für den Südwesten heraus.
          The authorities have issued a tsunami warning for the Southwest.

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17. According to this approach, the previous mention of *chihuahua* **entails** the successively mentioned hypernym *dog*, as well as a successive mention of *small dog*, cf. Baumann and Riester (2012: Section 3.5).

   c.   Auch im Inselstaat Vanuatu im Südpazifik wurden zwei Beben registriert.
Also in the island state of Vanuatu in the South Pacific two earthquakes have been registered.

(30)

Ein	starkes	Erdbeben	hat	Zentral-Japan	erschüttert.
a	strong	earthquake	has	central Japan	shaken
	(AP) L-NEW	(N) L-NEW		(NP) L-NEW	(V) L-NEW
	(NP) L-NEW			(DP) R-UNUSED	
	(DP) R-NEW			(VP) L-NEW	
	(IP) L-NEW				

(31)

Die	Behörden	gaben	eine	Tsunami-Warnung	für den	Südwesten	heraus.
the	authorities	gave	a	tsunami warning	for the	Southwest	out
	(NP) L-NEW	(V) L-NEW		(NP) L-NEW		(NP) L-NEW	(V) L-NEW
						(PP) R-BRIDGING	
	(DP) R-BRIDGING			(DP) R-NEW			
				(VP) L-NEW			
	(IP) L-NEW						

(32)

Auch	im	Inselstaat	Vanuatu	im	Südpazifik	wurden	zwei	Beben	registriert.
also	in the	island state	Vanuatu	in the	South Pacific	were	two	quakes	registered
		(N) L-NEW	(N) L-NEW		(NP) L-NEW			(NP) L-GIVEN	(V) L-NEW
					(PP) R-UNUSED			(DP) R-NEW	
		(PP) R-UNUSED						(VP) L-NEW	
	(IP) L-NEW								

The annotation proceeds along the principles defined above and consists of the following steps:

1. All referring expressions (DPs and PPs) receive an R-label. The phrases *the authorities* and *(for) the Southwest* are linked to (or anchored in) *central Japan* via bridging. In cases of syntactic embedding, e.g. [in the island state of Vanuatu [in the South Pacific]], R-labels are nested inside each other.

2. All content words (including verbal particles) receive an L-label (topmost line). In our example, the only L-GIVEN word is *quakes* in sentence (32), which is a near-synonym of *earthquake* in sentence (30). (Still the earthquakes are referentially distinct and independent from each other, thus the R-NEW label on *two quakes*.) It is debatable whether the phrase *tsunami warning* is L-NEW or rather L-ACCESSIBLE due to its intuitive relation to *earthquake*. However, since it is neither a (co-)hyponym nor a meronym of the latter there is so far no clear criterion which would license a classification of the expression as L-ACCESSIBLE.

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3. Following the syntactic structure of the sentences, complex non-referential phrases may be assigned L-labels as well. A complex phrase counts as L-GIVEN if it is entailed by another phrase in the discourse. This does not occur in the present examples (but see Section 5, example (55) below). A phrase is L-ACCESSIBLE if it entails an earlier phrase. At the sentence level, this might happen with elaborations, e.g. in (33).

(33)   a.   Sandy bought a car.
       b.   [L-ACCESSIBLE She chose a hybrid model].

In order to test the reliability of some aspects of the RefLex scheme, we had two trained student annotators independently assign R-labels to 3445 referring DPs/PPs in written news text from the DIRNDL corpus (Eckart et al., 2012), as well as L-labels to 5045 content words. The annotations were done with the SALTO tool (Burchardt et al., 2006). Since the annotators themselves had to identify the markables in pre-parsed syntactic representations, the spans of some of the markables had to be adjusted after annotation. For the label granularity defined in Table 1, an evaluation of inter-annotator agreement following Cohen (1960); Artstein and Poesio (2008) yields $\kappa = 0.75$ for the R-level and $\kappa = 0.64$ for the L-level. The value for the L-level is lower than in earlier annotation experiments conducted by the authors of this article. The main reason for the low score of the L-level seems to be a certain insecurity in classifying an expression as L-ACCESSIBLE. Obviously, there are more ways in which two items can be lexically related than the ones we list in Table 1.

4. Contrastive focus vs. novelty focus

A longstanding issue in information structure theory is the differentiation between so-called *contrastive focus* and *novelty focus* (*information focus*). When occurring in isolation, both types of focus are marked by nuclear pitch accents in English and German. In the terminology established in Section 1, both may be primary foci, although there is evidence that novelty focus sometimes receives comparatively weaker (or at least different) marking with regard to certain prosodic or acoustic parameters, see e.g. Alter et al. (2001); Selkirk (2002); Hedberg and Sosa (2008); Hermes et al. (2008); Katz and Selkirk (2011).

   The notion of *contrast* has received various interpretations in the literature on information structure and discourse structure, see Umbach (2004); Repp (2010). The most straightforward, though not tenable, definition is in terms of explicit mention of alternatives. Example (34) contains two pairs of contrastive foci (perhaps contrastive topics) in a parallel structure; the focus in (35) does not have an overt alternative and simply represents new information.

(34)   JOHN$_{F1/CT1}$ ordered WAter$_{F3}$, and MAry$_{F2/CT2}$ ordered BEER$_{F4}$.

(35)   Mary went into a pub. She [ordered BEER]$_F$.

(36)   Only MAry$_F$ drank beer.

Example (36) shows that explicit mention is not the only criterion for contrast. The exhaustive particle *only* in (36) requires a domain of individuals – an alternative set – who did not drink beer, except for Mary. Rooth (1992) presents a uniform account of alternative-eliciting focus in combination with focus-sensitive particles, overt contrast, scalar implicatures, question-answer pairs, ellipsis and comparatives. Several researchers, including Selkirk (2008), have taken these phenomena to establish the paradigm of contrastive focus.

Occasionally, contrastive focus has been assigned stricter definitions, especially in terms of *correction* or of *exhaustivity/identification*. While corrective contrast is often used in the design of minimal pairs of non-contrastive and contrastive contexts – see (37) vs. (38) – e.g. for the use in experiments of laboratory phonology, we argue that it should be seen as an extreme case of contrast (involving the rejection of a previous utterance) which might possess its distinct prosodic marking.

(37)   A: What did Mary drink?
         B: She drank BEER$_F$.   *(non-contrastive / non-corrective)*

(38)   A: Mary drank water.
         B: (No.) She drank BEER$_F$.   *(contrastive / corrective)*

Exhaustivity need not be expressed by means of a focus-sensitive particle like in (36) but also occurs with *it*-clefts, see e.g. Atlas and Levinson (1981); Hedberg (1990); Delin and Oberlander (1995); Reeve (2011), as a default interpretation of certain syntactic positions, like the preverbal position in Hungarian, e.g. Szabolcsi (1981); É. Kiss (1998); Kenesei (2006); Horvath (2010), or simply arise as a conversational implicature (Schulz and van Rooij, 2006; Spector, 2006) like in (39). B's answer is interpreted as saying that Mary was in the pub but no one else of a certain group which the interlocutors have in mind.

(39)   A: Who was at the pub?
         B: MAry$_F$ was there.

It can be assumed that in most cases in which an answer to a question is interpreted exhaustively, an alternative set has been introduced or accommodated beforehand. Interestingly however, É. Kiss (1998), who discusses exhaustivity in her account of so-called *identificational focus*, assumes it to be an independent property from *contrastivity*. While exhaustivity requires the *exclusion* but not necessarily the *identification* of the alternatives, *contrastivity* only requires that the alternatives form "a closed set of entities whose members are known to the participants of the discourse" (É.Kiss, 1998: 267) – but not necessarily their exclusion. We believe that the latter definition is very appealing, and will demonstrate below that it can be nicely applied when annotating natural language data.

Before doing so, however, we will return to Selkirk's (2008) criticism mentioned at the beginning of Section 3. Recall that Selkirk argues for a distinction between (contrastive) focus and discourse-new information, and against calling the latter *focus*. In doing so, she cites the influential work by Rooth (1992), who however – as far as we can tell – leaves it open whether his theory of *Alternative Semantics* also applies to plainly new information. Against Selkirk, we argue that there is a straightforward move to integrate new information into Alternative Semantics. This, however, requires some degree of exegesis of Rooth (1992) as it has been undertaken by Riester and Kamp (2010). The key to solving the problem lies in taking the semantics of focus as suggested in Rooth (1992) more seriously than has been done in parts of the contemporary literature on focus semantics. Alternative Semantics, in a nutshell, provides us with two important semantic components for a theory of focus: the first component is the *F-feature*, which, when applied to some syntactic constituent, introduces a second meaning, also called the *focus semantic value*, which is a set of elements of the same semantic type as the focussed constituent. The focus semantic value of the focussed expression *MAry$_F$* is D_e, the set of individuals.

Riester and Kamp (2010) note that, for natural discourse, we have to assume that D_e contains each and every individual on earth, since it is unrestricted. Therefore, it certainly does not meet the requirements for contrastiveness formulated by Kiss, namely that the alternatives form a closed set and be known to the participants of the discourse. In fact, the semantics of the F-marker can be seen as an operation which is completely blind to contextual information. Riester and Kamp (2010) call the focus semantic value an "anonymous" alternative set because its elements are unidentified. We shall assume, however, that such anonymous alternative sets, the result of F-assignment, are sufficent for the F-marked phrase to be called a *novelty focus*. Consider example (40), the beginning of a news feature, and its spoken realization in Figure 4.

(40)   Bundespräsident Köhler [HAT das GeSETZ zur Ge**SUND**heitsreform unterschrieben]$_F$.
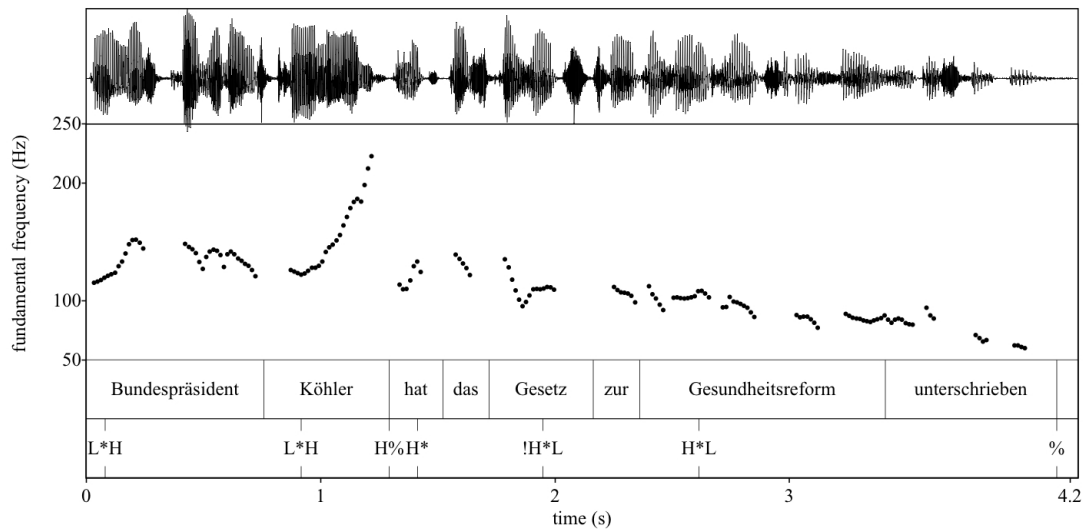   *Federal President Köhler has signed the bill on the health care reform.*

Figure 4: DIRNDL: s1790, 26-03-2007, 18:00, 3'20"

Let us assume that the VP of (40) is focussed – while ignoring other properties the sentence might have. Alternative Semantics tells us that the focus semantic value will consist of other VP denotations *(properties)* than signing the health bill. This means that the president might have "done other things", although we will have difficulties reaching an agreement what his specific other options had been, since neither the discourse context nor world knowledge tell us. The VP focus simply represents new information; the sentence is informative – a contingency[18] – but nothing more.

The second important component of focus semantics which Rooth (1992) introduces is the so-called *focus interpretation operator* ∼ ("squiggle"). Semantic-pragmatically, ∼ is defined as an anaphoric operator, which minimally imposes the following constraints on the interpretation of the constituent it attaches to:[19]

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18. We are grateful to Carla Umbach (p.c.) for suggesting the notion in this context.

19. For a formal specification in DRT and further explications see Riester and Kamp (2010). Note that there might be uses of ∼ in the literature which are not compatible with our strict anaphoric semantics.

Identify at least one proper alternative in the context

1. which matches the pattern defined by the focus semantic value of the phrase, and

2. which is different from the ordinary meaning of the phrase.

The attachment site of the $\sim$ operator is usually called the *focus domain* (Büring, submitted; Rooth, 2010) or, perhaps, the *focus phrase* (Krifka, 2006). However, not everybody might agree with all of our decisions where to attach $\sim$.

(41)   Die Europäische Union hat den Sklavenhandel früherer Jahrhunderte bedauert und sich gegen Formen $\sim$[**NEU**zeitlicher$_F$ Sklaverei] gewandt.
The European Union has expressed regret over the slave trade of earlier centuries and turned against forms of modern slavery.
(DIRNDL: s1618, 26-03-2007, 14:00, 5'47")

Example (41) nicely illustrates the fulfilment of the constraints imposed by the $\sim$ operator. (For the sake of simplicity we only highlight the nuclear pitch accent on the relevant phrase.) The phrase *neuzeitlicher Sklaverei* ('modern slavery') has a focus semantic value of the form $\{\llbracket X \; slavery \rrbracket \mid X$ is some intersective modifier$\}$. The discourse context contains the phrase *den Sklavenhandel früherer Jahrhunderte* ('the slave trade of earlier centuries'), whose ordinary meaning matches the template provided by (is an element of) the just mentioned focus semantic value (assuming that *slavery* and *slave trade* may be read as synonyms). The two complex expressions are distinct from each other and represent proper alternatives.[20] As we will clarify below, the identification of contrastive alternatives is not limited to the actual discourse context but does often make use of situational or world knowledge. This does not mean that identifying contrastive alternatives is always possible, as we see in (40).

Let us briefly summarise our theoretical assumptions surrounding the focus notion. We postulate that both new and contrastive information trigger (or represent) focus. Novelty focus merely carries the F-marker generating a focus semantic value as defined in Rooth (1992: 76). Contrastive focus, too, comes with an F-marker but is additionally interpreted by means of the anaphoric $\sim$ operator. The result of successful focus interpretation is the *identification* of at least one contrastive alternative. We loosely follow É. Kiss (1998) in assuming that contrastive identification means that the addressee is able to name *with certainty* who or what this contrastive alternative (or the set of alternatives) in the respective context is. Novelty focus, on the other hand, is defined as a focus with an anonymous – not clearly identifiable – alternative set.

Contrastive constituents may contain, or entirely consist of, given material. We see this in example (41), or in (42) – a selectional focus, which makes a choice from a given list.

(42)   John and Mary were at the pub but $\sim$[JOHN$_F$] left early.

This means that, in order to identify contrastive focus in corpus data we cannot confine ourselves to discourse-new constituents and decide whether their alternatives are identifiable or not. Rather, we

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20. Wagner (2006) shows that there has to be sortal compliance between two alternatives. For instance, *HIGH-END convertible* is a proper alternative to *CHEAP convertible* but not e.g. to *RED convertible*. What we presumably want is a notion of co-hyponymy, or what Lang and Umbach (2002) call the availability of a *common integrator*.

Sublabel of ALT	Description
FSP	Item is associated with a focus-sensitive particle.
OVERT	Item is an element of a pair or list of overtly contrastive expressions
-ARG	- Type-identical arguments of the same predicate.
-COMP	- Items occur in a comparative construction.
-COORD	- Items are coordinated.
-EXT	- Items occur in different sentences – sentence-external contrast
SEL	Item selects one element from a pair or list of *previously* introduced alternatives.

Table 2: Alternative-eliciting features

must look for specific *alternative-eliciting* features or constellations (ALT). A list of such features is presented in Table 2.[21]

Note well that having spotted an alternative-eliciting constellation is not yet having identified contrastive focus. Beaver and Velleman (2011: 1674) state that speakers are not obliged to mark contrast. We agree with this view. The fact that e.g. two co-hyponymic expressions, say *an elephant* and *a lion*, occur as the arguments of the same predicate (ALT-OVERT-ARG), as in (43), does not mean that they are necessarily contrasted against each other although the speaker might decide to establish the contrast prosodically, for instance by forming two prosodic phrases rather than one. This would then signal that the order of arguments could have been the other way round.

(43)   [ALT-OVERT-ARG An elephant] chased [ALT-OVERT-ARG a lion].

On the other hand, there are also triggers, e.g. focus-sensitive particles, which seem to necessarily associate with a contrastive focus (ALT-FSP).[22] When we apply our set of features from Table 2 to example (29), we obtain an additional tier of *elicited alternatives*, shown in (44) and (45).

(44)

Ein	starkes	Erdbeben	hat	Zentral-Japan	erschüttert.
				ALT-OVERT-EXT	

(45)

Auch	im	Inselstaat	Vanuatu	im	Südpazifik	wurden	zwei	Beben	registriert.
	ALT-FSP / ALT-OVERT-EXT								

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21. A different list of features for "contrastive focus" is provided in Götze et al. (2007: 178ff).

22. The following table shows the frequencies of the most common conventional FSPs in German, in a sample of 2484 sentences from the DIRNDL corpus. However, about 90% of the sentences do *not* contain an FSP, which shows the need to identify other features than just ALT-FSP.

Particle	Translation	*n*
auch	too	107
nur	only	62
wieder	again	53
ebenfalls	too	8
lediglich	only	5
nicht einmal	not even	1
weder … noch	neither … nor	1
sogar	even	–
bloß	only	–

The phrase *im Inselstaat Vanuatu im Südpazifik* associates with the additive particle *auch*. It can furthermore be contrasted with *Zentral-Japan*. In the following, we give corpus examples for the remaining alternative-eliciting features.

Exchangeable arguments of a predicate (ALT-OVERT-ARG):

(46)   [ALT-OVERT-ARG Die Fluggesellschaft Air Berlin] übernimmt [ALT-OVERT-ARG den Düsseldorfer Konkurrenten LTU].
Airline company Air Berlin will absorb its Düsseldorf rival LTU.
(DIRNDL: s2428, 27-03-2007, 08:00)

Comparative (ALT-OVERT-COMP):

(47)   Huber meinte in Dortmund zur Begründung, [ALT-OVERT-COMP in der Metall-Branche] sei die Lage stabiler als [ALT-OVERT-COMP in der Chemieindustrie].
Huber explained in Dortmund that the situation in the metal industry was more stable than in the chemical industry.
(DIRNDL: s1943, 26-03-2007, 21:00)

Coordination (ALT-OVERT-ARG):

(48)   Falls sich [ALT-OVERT-COORD die protestantische Unionisten-Partei DUP] und [ALT-OVERT-COORD die katholische Sinn Féin] bis 24 Uhr Ortszeit nicht auf ein Bündnis einigen, [. . .]
Unless the protestant Unionist Party DUP and the catholic Sinn Féin reach an agreement on an alliance until 12 p.m. local time [. . .]
(DIRNDL: s1249, 26-03-2007, 07:00)

Parallelism, sentence-external contrast (ALT-OVERT-EXT):

(49)   [ALT-OVERT-EXT Kevin Kuranyi] schoss in Prag beide Tore für die deutsche Elf. [ALT-OVERT-EXT Milan Baros] erzielte den Anschlusstreffer.
In Prague, Kevin Kuranyi scored both goals for the German team. Milan Baros scored the other goal.
(DIRNDL: s59-s60, 25-03-2007, 01:00)

Selection (ALT-SEL):

(50)   Darauf verständigten sich die Parteivorsitzenden Paisley und Adams bei ihrem ersten persönlichen Treffen in Belfast. Das Amt des Ersten Ministers soll [ALT-SEL Paisley] übernehmen.
At their first personal meeting in Belfast, the party chairmen Paisley and Adams reached an agreement on the issue. Paisley will become the First Minister.
(DIRNDL: s1696, 26-03-2007, 16:00)

As we said, we are not currently claiming that speakers have to mark all of the above alternative-eliciting constellations prosodically, although they often will do so. More research is necessary on each of them. The fact that marking contrastive focus is sometimes optional is one reason why texts allow for intonational variation when being read aloud. From an annotation perspective, however, this means that identifying all cases of contrastive focus requires some advanced (top-

down) reasoning about potential questions under discussion, including supplemental questions, as sketched in Section 2. Alternatively, it requires reverting to the spoken signal – what we have called the bottom-up approach – including the assumption that nuclear pitch accents always signal focus, which we can then classify as either contrastive or non-contrastive.[23]

A final problem which we currently cannot solve without falling back on spoken language is the identification of *implicit contrast*. By this we mean obvious cases of contrastive interpretation which do not come with one of the above features and whose marking likewise seems optional. Consider Figure 5, showing a section from the context given in (51), in which a nuclear pitch accent occurs on the negation particle *nicht* ('not').
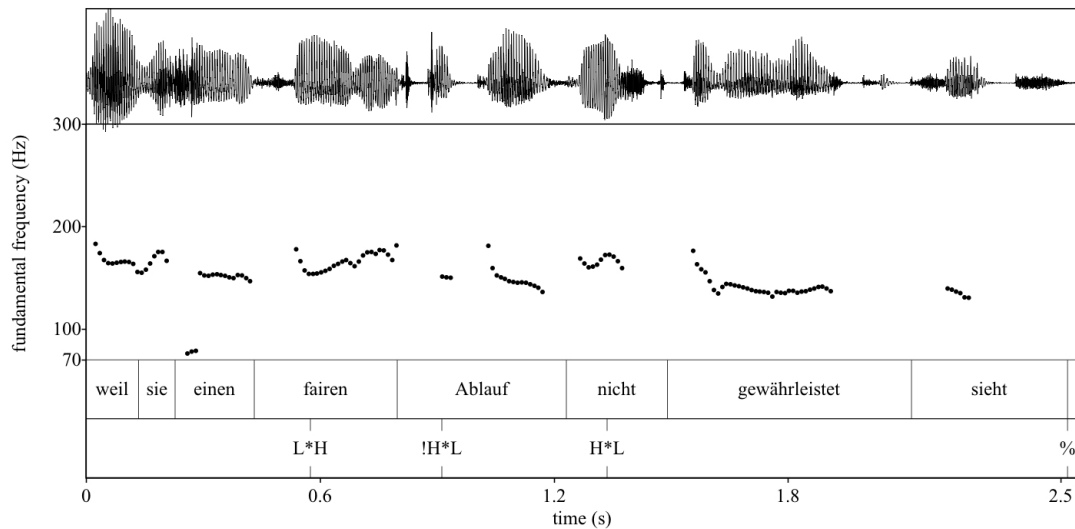
Figure 5: 'because they do not believe that a fair process is guaranteed' (DIRNDL: s1603, 26-03-2007, 14:00, 3'53")

(51)   In Ägypten entscheiden die Bürger in einem Referendum über zahlreiche Verfassungsän-derungen. Allein in der Hauptstadt Kairo sind tausende Polizisten im Einsatz, um die Volksabstimmung abzusichern. Dort war die Beteiligung am Vormittag aber gering. Die Opposition hat zum Boykott aufgerufen, ∼[weil sie einen fairen Ablauf [ALT-IMPLICIT **NICHT**$_F$] gewährleistet sieht].
In Egypt, today the citizens are deciding on a number of amendments to the constitution. In the capital Cairo alone, thousands of policemen are on duty to secure the referendum. However, there the turnout in the morning was low. The opposition has called for a boycott because they do not believe that a fair procedure is guaranteed.

Knowing that the nuclear pitch accent is on *nicht* intuitively evokes the contrastive interpretation that someone in the context suggested that the voting procedure would be fair. This is what is

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23. As should have become clear by now, this will leave a number of problems unsolved, including the question which other forms of prosodic prominence are also markers of focus.

indicated by the ∼ operator at clause level, while the F-marker is on the negative polarity. Clearly, the version in Figure 5 is not the only way the sentence can be pronounced. Instead, the speaker might have chosen not to not mark the contrast, thus producing a novelty focus as in (52).

(52)　　[...] weil　　sie　[einen fairen Ablauf　　nicht ge**WÄHR**leistet sieht]$_F$.
　　　　　　because they a　　fair　procedure not　guaranteed　　　see

There are many conceivable ways of evaluating the proposals made in this section. For example, it would have been possible to have annotators detect alternative-eliciting features. However, as a first step we asked annotators to tell apart contrastive from non-contrastive focus. To this end, we reverted to a bottom-up process: we selected 3842 nuclear pitch accents from the DIRNDL corpus (only the final pitch accents of an intonation phrase), disregarding their accent type (rise, fall etc.). We made the reasonable assumption that all of them mark some sort of focus. The question we were interested in was whether these foci would be contrastive or merely new information. Two independent student annotators were provided with the accented words as well as the containing sentence plus context. Their task was to say whether they could identify against *what* an accented word was contrasted in the given context. For validation purposes, they were asked to note down the explicit or implicit alternative. Finally, they had to label the focus as either non-contrastive (NO-CONTRAST), implicitly contrastive (ALT-IMPLICIT), or marked by an alternative-eliciting feature from Table 2. As a result, we obtain a κ-value of 0.56 for the eight categories. The score slightly improves to $\kappa = 0.58$ if we only consider the three categories non-contrastive, implicitly contrastive, and marked by an explicit ALT-feature. Nevertheless, determining contrastive focus turned out to be a more difficult task than expected. In a final consensus annotation we classify the nuclear pitch accents as marking the focus types shown in Table 3. Note that the table does not allow for any conclusions with regard to the total ratio of contrastive versus non-contrastive foci in the complete data, since it leaves aside foci marked by nuclear pitch accents of intermediate phrases as well as pre- and postnuclear prominence.

Label	n
ALT-FSP	45
ALT-OVERT-ARG	315
ALT-OVERT-COMP	12
ALT-OVERT-COORD	484
ALT-OVERT-EXT	234
ALT-SEL	36
ALT-IMPLICIT	479
NO-CONTRAST	2237

Table 3: (Non-)contrastive focus on 3842 (intonation-phrase final) nuclear pitch accents

5. Second occurrence focus and secondary accents

In the remaining part of this article we return to the issue of *second occurrence focus (SOF)*, already discussed in Section 1. Describing the precise conditions which license second occurrence focus is not straightforward. In particular, SOF is not sufficiently characterised by defining it as a (con-

trastively) *focussed* and *given* constituent. A counterexample is shown in (53b) (Büring, submitted) in which the second occurrence of *John* is realised as a primary – not secondary – focus.

(53)   a.   Many people only drank JUICE$_F$ at John's party.
          b.   Even **JOHN**$_F$ only drank JUICE$_{SOF}$ at his party.

Beaver and Velleman (2011) discuss at length the licensing conditions for second occurrence focus. In particular, they reject proposals which rely on the size (or mutual embedding) of the focus domains (Büring, submitted; Rooth, 2010) or which redefine the notion of givenness for focussed constituents (Selkirk, 2008). We will not repeat their argumentation here. The characterization of an SOF given by Beaver and Velleman (2011) is a constituent which is "important" (in our terminology ALT-marked) as well as "predictable", where predictability is defined as "givenness-all-the-way-up" – a constituent is predictable if and only if it is given and its containing phrasal context is given as well. From this it follows that an unpredictable constituent must be either new or occur in a new argument slot. In (53b), the given phrase *juice* occurs in a likewise given VP – it is predictable – while the given expression *John* newly occupies the agent role, and is therefore unpredictable.

In (54) and (55) we see a complete RefLex and elicited-alternatives annotation of the SOF example (6), which was introduced in Section 1.[24] We observe that the second occurrence of *vegetables* in (55) is embedded under other given constituents.

(54)

Everyone	knew	that	Mary	only	eats	VEgetables.
	(V) L-NEW		(NP) L-NEW		(V) L-NEW	(NP) L-NEW
			(DP) R-UNUSED			(DP) R-GENERIC
					(VP) L-NEW	
			(IP) L-NEW			
		(CP) R-UNUSED				
	(VP) L-NEW					
(IP) L-NEW						
						ALT-FSP

(55)

Even	PAUL	knew	that	Mary	only	eats	VEgetables.
	(NP) L-NEW	(V) L-GIVEN		(NP) L-GIVEN		(V) L-GIVEN	(NP) L-GIVEN
	(DP) R-UNUSED			(DP) R-GIVEN			(DP) R-GENERIC
						(VP) L-GIVEN	
				(VP) L-GIVEN			
			(CP) R-GIVEN				
		(VP) L-GIVEN					
	(IP) L-GIVEN						
	ALT-FSP						ALT-FSP

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24. The definite subject *everyone* is left unannotated here because, strictly speaking, we are not dealing with an out-of-the-blue utterance but a constructed example which presupposes some context. In normal discourse, speakers would limit the use of *everyone* to contexts in which it is clear which group is being referred to. In other words, the domain of the universal quantifier is restricted to an identifiable set in the context. Therefore, the most appropriate label for *everyone* is probably R-GIVEN, which might strike some readers as odd in the absence of any explicit context.

The reader is encouraged to verify that every constituent marked L-GIVEN is entailed by the context (in this case, simply repeated), while R-GIVEN phrases are coreferential. We shall assume that the *that*-CP behaves similar to a definite DP while referring to a *fact*.

The last issue which we are going to discuss are other types of *secondary focus* which are not *second occurrence foci*. Consider that, instead of (55), the speaker would have chosen to say (56).

(56)

Even **PAUL** knew	that	Mary	is	picky.
		$_{(NP)}$ L-GIVEN		$_{(AP)}$ L-NEW
		$_{(DP)}$ R-GIVEN		
		$_{(IP)}$ L-NEW		
		$_{(CP)}$ R-GIVEN		

The utterance in (56) is clearly subjective. The speaker does not merely tell us that even Paul knew that Mary is a vegetarian but she also lets us know, en passant, that she considers vegetarians picky. We only get this interpretation because the entire CP does not carry a nuclear pitch accent but instead comes with a compressed intonation contour. It is only because of this postnuclear compression that we obtain the interpretation that (the speaker thinks that) the two CPs boil down to the same thing.[25] The second CP is therefore labelled as referentially given. The question whether the CP in (56) is deaccented or whether it carries postnuclear prominence cannot be solved by introspection and therefore requires experimental research. Telling from the RefLex annotations, however, we are able to state that the embedded clause contains lexically new material, and we might furthermore argue that the new information contained in the clause is *not-at-issue* – compare Section 2 – and gives an answer to the speaker-oriented question *What is Mary like, according to the speaker?* We think that this is sufficient reason to grant the embedded predicate the status of a novelty focus, which, when indeed marked by postnuclear prominence would count as a secondary focus.

In analogy to the case in (56), we can also construct examples involving a coreferential DP consisting of lexically new material. Such expressions have sometimes been called *epithets* in the literature (Clark, 1977; Schlenker, 2005; Potts, 2005; Riester, 2009). *Expressives*, as in (57B), are one kind of epithets. Again they represent not-at-issue content and will be considered novelty foci. (Question: *What does the speaker think about Fred?*)

(57)

A:	Do you know where Fred is?		
B:	I haven't **SEEN**	the	goddam idiot.
			$_{(NP)}$ L-NEW
		$_{(DP)}$ R-GIVEN	

In our corpus, we do find instances of epithets which are marked by postnuclear prominence (mainly indicated by increased duration and intensity of lexically stressed syllables). Figure 6 shows an example of the R-GIVEN, L-NEW DP *der serbischen Provinz* ('of the Serbian province'), which corefers with the phrase *Kosovo* in the context shown in (58).

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25. This is a behaviour well-known from definite DPs. Compare example (i) from Umbach (2002):

(i) {John has an old cottage.}

   a. Last summer he reconstructed [the SHED].   (non-coreferential)
   b. Last summer he reconSTRUCted [the shed].   (coreferential)
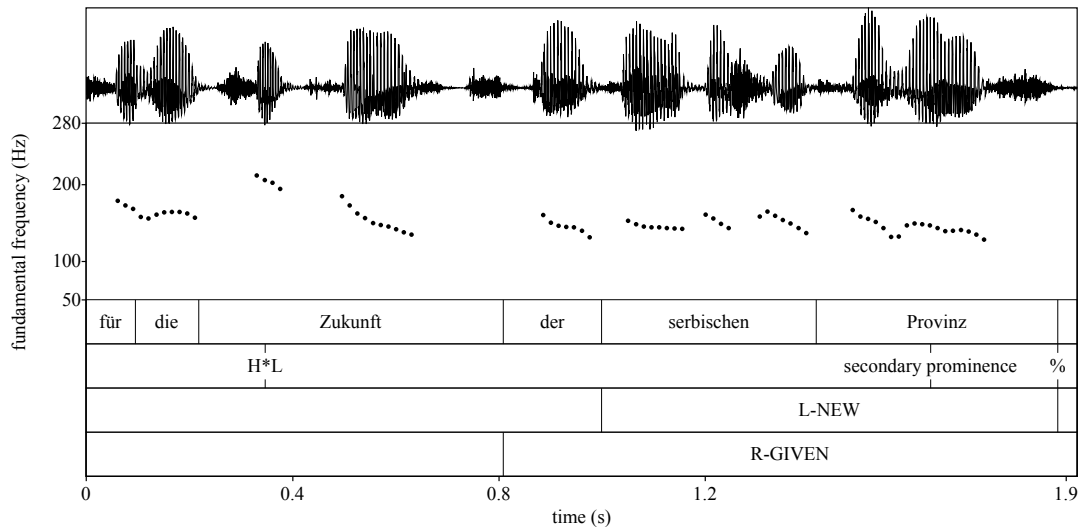
Figure 6: Realisation of an epithet (R-GIVEN, L-NEW); (DIRNDL: s1730, 26-03-2007, 17:00, 0'31")

(58)   Der UNO-Sondergesandte Ahtisaari plädiert für eine Unabhängigkeit des Kosovo unter internationaler Aufsicht. Dies sei die einzige politische und wirtschaftliche Option für die **ZU**kunft der serbischen PROVINZ.
        UN Special Envoy Ahtisaari is making the case for an independence of the Kosovo under international control. According to him, this is the only political and economic option for the future of the Serbian province.

So far, this is merely anecdotal evidence, and more elaborate statistical investigations are necessary. We would like to point out, however, that Baumann and Riester (to appear) did find – mainly in a corpus of read speech – that expressions which possess a "hybrid" information status (e.g. R-GIVEN, L-NEW), such as epithets, were marked as significantly less prominent than fully new items and significantly more prominent than fully given items. Only some of them were encoded by postnuclear prominences, others by prenuclear accents, or less prominent (e.g. low) accent types. Actually, several kinds of secondary prominence have been proposed in the literature, e.g. duration accents (Kohler, 2005), ornamental accents (Büring, 2007), or phrase accents (Grice et al., 2000), mentioned in Section 1 above. However, the various concepts refer to quite different phenomena or levels: first, the presence or absence of a pitch movement, i.e. tonal vs. non-tonal prominence (e.g. Kohler's duration accents are non-tonal); second, accent position or the status of a prominence in the prosodic hierarchy (e.g. ornamental accents are prenuclear, phrase accents postnuclear); and third, accent type, i.e. the form of a pitch movement on a metrically strong syllable; high or rising accents are more prominent than low or falling ones, see e.g. Baumann and Grice (2006). While there is a growing body of evidence that these three levels of prosodic prominence are used for marking various aspects of information structure, cf. Baumann (2012), it is a matter of some debate whether the current ToBI (and GToBI) systems are suited to represent the relevant distinct types

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of information structural meaning – although at least the distiction between several types of pitch accent has always been a central incentive for the definition of the ToBI labels, see for instance Pierrehumbert and Hirschberg (1990); Steedman (1991).

6. Conclusions

In this article, we have discussed a number of problems which arise when issues from the theoretical and experimental tradition of information structure are brought together with corpus data, such as spoken radio news. In parts of the literature, focus is discussed as a semantic-pragmatic phenomenon which is related to the answering of questions under discussion. Since the latter are mostly implicit in monological discourse, it seems, however, that their identification is almost as subtle as the identification of focus itself. Corpus data can open our eyes to a number of issues that have often been ignored in research on focus, for instance the fact that spoken utterances contain prenuclear *and* nuclear pitch accents as well as various kinds of postnuclear prominence. On the meaning side, this corresponds to the fact that the informative parts of a sentence have an internal structure that can be revealed by asking (nested) questions. As a result, we can have several semantic-pragmatic foci within one sentence, which have different degrees of communicative significance and which are marked by different kinds of prosodic prominence.

Information structure has a long history of theory building which has produced highly complex models, sometimes based on relatively thin empirical evidence. The precise mapping between the semantic-pragmatic and the prosodic phenomena is still not sufficiently described. (The same can be said about morpho-syntactic focus marking in cross-linguistic perspective.) We are convinced that building and analysing annotated corpus resources can complement experimental and theoretical research in this regard.

A big problem in focus theory is its non-standardised terminology. Are there one or several kinds of focus, and is new information one of them? How should givenness and contrast be defined? Is contrastive topic a kind of focus? What is the precise definition of the F-feature and the ∼ operator? What is a focus domain? Researchers have provided diverging answers to these problems, including the authors of this paper. In principle, nothing speaks against different terminological choices as long as they are made transparent. On the other hand, it is plain that certain terminological and classificatory decisions can blur rather than clarify insights into linguistic phenomena and may cause problems in view of larger theoretical structures. Linguistic annotation is an important testbed for both theory and terminology: the ability to annotate a certain phenomenon is support for its underlying theoretical conceptualisation.

In this article we have provided two proposals with respect to the annotation of information structure: (i) the RefLex scheme, a framework for the annotation of information status, divided into a referential and a lexical level, and (ii) a set of alternative-eliciting features, which represent the basis for a speaker's decision to mark contrastive focus. We furthermore postulate that plainly new information represents the basic type of focus. While both types of focus involve alternatives, the defining criterion for contrastive focus is the addressee's ability to *identify* (and name) at least one of these alternatives, in the respective context. While the annotation of information status can (and should) be accomplished without access to prosody, the annotation of contrastive focus in English and German will ultimately require the use of spoken information since it can only partially be determined on the basis of written data alone. Finally, we discussed the phenomenon of second occurrence focus in the light of general assumptions about prosodic structure and the pragmatics of

focus, and concluded that it is not the only kind of focus which is realised by means of secondary prominence. Very likely, there are other focal phenomena, like non-at-issue content, or expressions with a hybrid information status which are sometimes marked by means of prenuclear or postnuclear prominence.

Acknowledgements

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