# 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 linguistic notion of *focus* – which has been intensively investigated in the theoretical literature[2] – 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

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1. This is a completely revised and extended version of an article which appeared 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.

2. A few references: Halliday (1967); Chomsky (1971); Jackendoff (1972); Rooth (1992); Krifka (1992); Selkirk (1995); Roberts (1996); Hajičová et al. (1998); É. Kiss (1998); Schwarzschild (1999); Büring (2003); Krifka (2008); Beaver and Clark (2008)

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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*.

The first assumption which we shall make in this paper is that in English or German,[3] and presumably in other languages, there can be several foci in the same prosodic phrase but only one of them can be marked by a *nuclear pitch accent*. We call this one the *primary focus*.

**Definition 1 (Primary focus)** *A primary focus is a focus constituent which is marked by means of a nuclear pitch accent.*

Note that Definition 1 neither says what a focus is in general, nor why and when it may receive a nuclear pitch accent, nor whether it has to be marked at all. This requires some clarification: 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 (Section 2). For the beginning, let us settle for an intuitive focus notion which says that focus indicates new or important parts of an utterance.

It seems as if the literature contains many examples in which there are two *primary* foci in the same clause. Examples are given in (1) to (4), with relevant pitch accents marked by capital letters.

(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$_{F1}$ opinion]$_T$, JOHN$_{F2}$ stole the cookies.                      (Krifka, 2008)

The phenomenon in (1) has been called *multiple focus*. It is characterised by the presence of two focus-sensitive particles, *even* and *only*, within the same clause. The focused constituents are indexed by F1 and F2. In (2B), the two foci form a *complex focus*. They highlight a choice from among two pairs of alternatives provided by question (2A). In addition to that, the (pairs of) foci may also be called *contrastive foci*, due to the presence of overt alternatives. (3B) is a protoypical example involving a *contrastive topic* (CT), which is assumed to share basic properties of focus, in particular, the ability to highlight the availability of alternatives. In opposition to (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. In using the contrastive topic, the speaker of (3B) announces to continue and tell us what other persons ate. The first focus in (4) is used within a *frame-setting topic* (T), which likewise divides the interpretational space into alternative partitions. Ignoring the fact that the pitch accents occurring on the two respective focal elements in (1)-(4) 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.[4] This holds true for all four examples.

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3. 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.

4. 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 can be shown to be true in general, then (1) is not an example with two primary foci.

All we have said so far is compatible with the requirement that there can be only one primary focus per prosodic phrase, since we may assume that, in all of the above examples, 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)    $\{\{ (PN_1 \ldots PN_n) \, \mathbf{N} \, (pn) \, \text{-}\}_{ip} \, \{ (PN_1 \ldots PN_m) \, \mathbf{N} \, (pn) \, \text{-}\}_{ip} \, \%\}_{IP}$

Here, (PN) stands for an optional prenuclear accent, several of which may occur, **N** is the nuclear pitch accent, and (pn) indicates an optional postnuclear prominence. The latter is not supposed to carry the rank of a pitch accent and is signaled by means of increased duration and intensity but only very little pitch movement. It is sometimes called *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, in fact, widespread to have several (semantic-pragmatic) 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 (Rooth, 1996; Partee, 1999; Bartels, 2004; Büring, 2008, ms.; 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[5] 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 claimed to be completely deaccented. We will return to the issue of second occurrence focus in Section 5. At this point, we merely note that SOF is one instance from the class of *secondary foci* defined below.

**Definition 2 (Secondary focus)** *A secondary focus is a focus constituent which is not marked by means of a nuclear pitch accent but by some pre- oder postnuclear prominence.*

Obviously, our definitions of *primary* and *secondary focus* are not fully pragmatic in nature since they make reference to prosodic concepts. In the long run, one would like to replace Definitions 1 and 2 by purely pragmatic definitions which predict when exactly a focus receives a nuclear pitch accent. We think that, seen from the perspective of corpus analysis, it is still too early for that.[6]

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

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5. In both (6a) and (6b), *vegetables* is associated with the focus adverb *only*.

6. The question of predicting which focus receives more prosodic prominence is addressed in Selkirk (2008); Büring (2008, ms.); Rooth (2010) or Beaver and Velleman (2011). Büring 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. However, a definition like that presupposes a solution to the problem of identifying focus domains.

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 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]
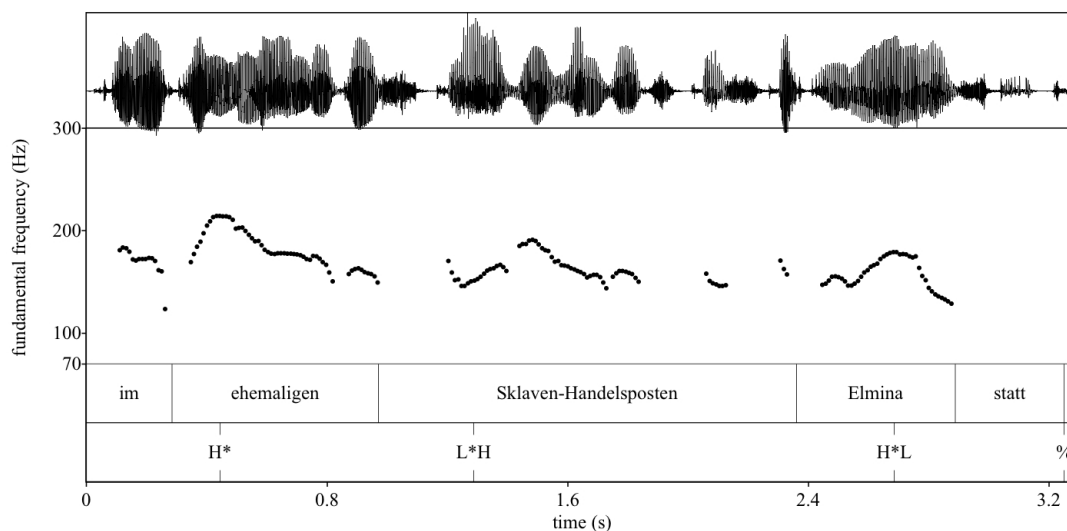


Figure 1: PRAAT (Boersma and Weenink, 1996) screenshot; DIRNDL s1222, 26-03-2007, 06:00, 7'12": *in the former slave trading post Elmina*

(7)    In **GHA**na   fand ein **FEST**akt   im Ehemaligen SKLAven-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.[8] 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 some good experimental evidence about its prosodic marking. Nevertheless, all that knowledge still seems quite

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7. Nuclear pitch accents are indicated in boldface, prenuclear accents in small capitals.
8. Büring (2007) calls these accents "ornamental".

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).

In Section 3, we present 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 non-contrastive 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 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[9] – 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.[10] 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 what is the discourse strategy to which

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9. 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.

10. 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's 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.

it belongs; second, identify the phrases which provide an answer to the current Question under Discussion; and third, predict or observe how these phrases are marked prosodically (and/or morphosyntactically).[11] 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. Nevertheless, 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 overt 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).

(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 unfocussed (backgrounded) word *Kind* ('child') and the deaccenting of the predicate *geschenkt* ('given as a present').[12] As for Example (7), we already assumed that the focus encompasses the phrase in (11).

(11)    [fand ein **FEST**akt im Ehemaligen SKLAvenhandelsposten ElMIna 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's (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).

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11. As is well-known, some languages do not mark 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.

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

(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 (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 is relevant 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).

(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* (see Definition 1 above). F3 is only marked by (two) prenuclear accents; we therefore call it a *secondary focus* (Definition 2).

    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). It allows us to use the following language-independent pragmatic focus definition.

**Definition 3 (Focus)** *A focus is either an answer to the immediate (explicit or implicit) Question under Discussion (at-issue focus) or to a supplemental question (not-at-issue focus).*[13]

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.[14] We call this the *bottom-up* approach to focus identification. Obviously,

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13. In (16), we may call F1 an *at-issue focus*, and F2/F3 *not-at-issue foci*.

14. 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[.]"

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.[15] 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 do not yet caim to annotate all aspects of focus. Other proposals of annotating information structure involve, for instance, Hajičová et al. (2000), Paggio (2006), Götze et al. (2007), or Cook and Bildhauer (2013). In Paggio (2006), focus is defined, following Lambrecht (1994), as "non-presupposed" information. Further rules given to the annotators include, for instance, the requirement to identify at least one focus per sentence and at least one "main accent" per focus (for Danish data). In Götze at al. (2007: 170), the definition for focus is "[that] part of an expression which provides the most relevant information in a particular context [...]". Subcategories for *new information focus* and *contrastive focus* are defined. We believe that these proposals capture some important aspects of focus in corpus data but are less complete and less detailed than the picture that we are developing in this article.

## 3. Annotating given-new information: the RefLex scheme

In accordance with Definition 3, we adopt a concept 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, since this is in conflict with the QUD approach.

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15. 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.

In Section 4, we will account for the distinction between contrastive and non-contrastive (novelty) focus in a way that is compatible with both QUDs and Rooth's Alternative Semantics. 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 have given 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, 1992) – 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 first 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).[16] The procedure described in this section will not tell us how many different foci a sentence contains. But it already provides us with a fine-grained analysis with a view to its prosodic correlates; see Baumann and Riester (in press).

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 in Baumann and Riester (2012).

### 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 and Hasan (1976: 288) distinguish 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 applied simultaneously, as shown below.

By use of the 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 |  |

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16. A warning: Beaver and Clark (2008: 15) notice that not all F-markers used in the literature have the same function, e.g. F-markers used in Rooth (1992) and in Selkirk (1995) are used for different purposes.

(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 vice versa, 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).

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 | yesterday | 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.[17] 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.[18]

(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 | |

---

17. We assume a somewhat arbitrary window of five sentences. A more precise range in which word associations still play a role needs to be determined experimentally.

18. Arguably in (26), in addition to the L-label on the word *Italy*, the DP *Italy* and the PP *in Italy* both should receive separate R-UNUSED labels, since the former refers to the country itself and the latter to a location.

(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

| R-Level | | L-Level | |
|---|---|---|---|
| Units: DP, PP, *that*-CP | | Units: A(P), Adv(P), N(P), V(P), S | |
| Label | Description | Label | Description |
| R-GIVEN | coreferential 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

Table 1 contains the most important labels of the RefLex annotation scheme. For a more detailed 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 of what counts as a unit for annotation is influenced by the choice of syntactic theory which the analysis is based on. A principled distinction can be made between expressions which refer to some *entity,* like an individual, a place,
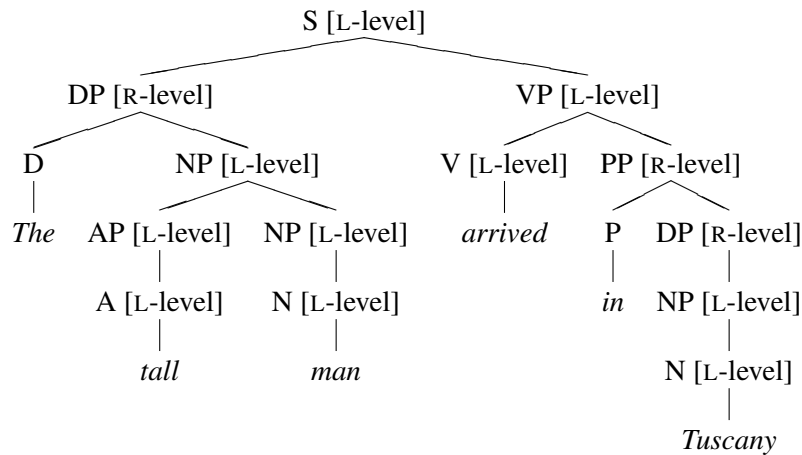
S [L-level]
DP [R-level]                  VP [L-level]
D        NP [L-level]       V [L-level]   PP [R-level]
*The*   AP [L-level]   NP [L-level]   *arrived*   P    DP [R-level]
A [L-level]   N [L-level]   *in*   NP [L-level]
*tall*   *man*   N [L-level]
*Tuscany*

Figure 2: Basic target units for *RefLex* annotations

a fact etc. (DP, PP, *that*-CP),[19] and expressions which denote a *property / set of entities* (NP, AP, VP, AdvP, S) or a relation.[20]

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. For instance, one of the L-labels at either the N or the NP level above *man* can of course be dropped, since they are identical. 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 make use of his idea to generalise lexical relations to a notion of entailment.[21]

As we said, 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 a sample annotation of a German sentence from the DIRNDL corpus (Eckart et al., 2012).[22]

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19. 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* – 'in the', *zum* – 'to the' 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.

20. 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 abstain from the debate whether a sentence should be analysed as an IP (inflection phrase), as a CP (as in the German example shown in Fig. 3) or as a projection of tense, aspect or voice, cf. Adger (2003).

21. 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: 133ff.)

22. The sentence was parsed using XLE (Crouch et al., 1993-2011, ms.) and the German Lexical Functional Grammar implementation 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.
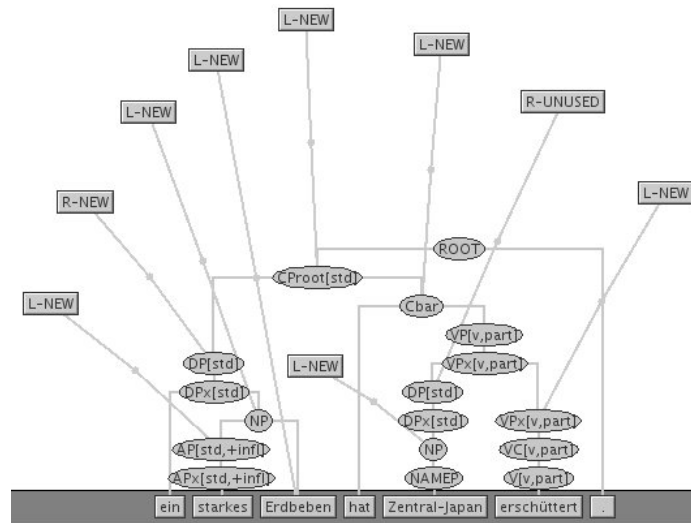
Figure 3: Sentence annotated in SALTO, DIRNDL s165, 25-03-2007, 5:00: *A strong earthquake has hit central Japan.*

In the following, we will briefly show how the extended annotations can be applied to news data. 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.*
    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 | | |
| $(S)$ 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 | | | | |
| $(S)$ L-NEW | | | | | | | |

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(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 |
| | | $_{(NP)}$ L-NEW | | $_{(PP)}$ R-UNUSED | | | | $_{(DP)}$ R-NEW | |
| | | $_{(PP)}$ R-UNUSED | | | | | | $_{(VP)}$ L-NEW | |
| | | | | $_{(S)}$ 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 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.

3. Following the syntactic structure of the sentences, complex non-referential phrases are 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). 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.[23] The annotations were done in SALTO (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) and 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 relatively 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.

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23. For this evaluation we did not consider *that*-CPs and complex phrases.

## 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. According to Definition 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 the explicit mention of alternatives. Example (34) contains a pair of contrastive topics and a pair of contrastive foci in a parallel structure; the focus in (35) does not have an overt alternative and simply represents new information.

(34)    $JOHN_{CT1}$ ordered $WAter_{F1}$, and $MAry_{CT2}$ ordered $BEER_{F2}$.

(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 for cases of association 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 (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 (Szabolcsi, 1981; É. Kiss, 1998; Kenesei, 2006; Horvath, 2010), or simply arises 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 literally 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 (unrestricted) set of individuals. Büring (2013) has used the attribute "raw" for such unfiltered focus semantic values.

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 has not undergone any restriction. Therefore, it certainly does not meet the requirements for contrastiveness formulated by É. 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 of a natural language expression an "anonymous" alternative set because its elements are, at the outset, unidentified. We shall assume, however, that such anonymous alternative sets, the result of F-assignment, are suffcient 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.*

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[24] – but nothing more.

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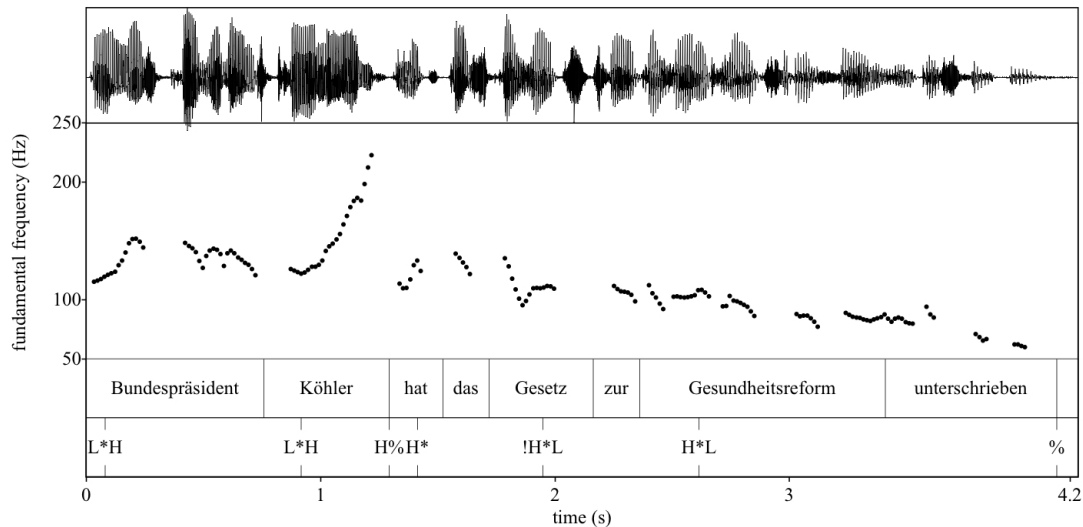24. We are grateful to Carla Umbach (p.c.) for suggesting the notion in this context.

Figure 4: Novelty focus; DIRNDL s1790, 26-03-2007, 18:00, 3'20": *has signed the bill on the health care reform*

The second important component of focus semantics which Rooth (1992) introduces is the so-called *focus interpretation operator* $\sim$ ("squiggle"). Semantic-pragmatically, $\sim$ is defined as an anaphoric operator, which minimally imposes the following constraints on the interpretation of the constituent it attaches to:[25]

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 sometimes called the *focus domain* (Büring, 2008; Rooth, 2010) or, perhaps, the *focus phrase* (Krifka, 2006). However, opinions differ 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*

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

*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.[26] As we will clarify below, the identification of contrastive alternatives is not limited to the actual discourse context but does often rely on situational or world knowledge. This does not mean that identifying contrastive alternatives is always possible, as we see in (40). We are now in a position to delimit (non-contrastive) novelty focus from contrastive focus.

**Definition 4 (Novelty focus)** *A novelty focus is a non-given constituent which serves as an answer to the immediate QUD or to a supplemental question and whose alternatives remain unidentified.*

**Definition 5 (Contrastive focus)** *A contrastive focus is a constituent which serves as an answer to the immediate QUD or to a supplemental question and whose alternatives can be unanimously identified in the context (i.e. discourse context, encyclopaedic knowledge, lexicon etc.)*

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 (Definition 5). Novelty focus, on the other hand, is defined as a focus with an anonymous – not clearly identifiable – alternative set (Definition 4).

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 must look for specific *alternative-eliciting* features or constellations (ALT). A list of such features is presented in Table 2.[27]

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 around.

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

---

26. 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 kind of co-hyponymy, or what Lang and Umbach (2002) call the availability of a *common integrator*.

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

| Sublabel of ALT | Description |
|---|---|
| FSP | Item is associated with a <u>f</u>ocus-<u>s</u>ensitive particle. |
| OVERT | Item is an element of a pair or list of <u>overt</u>ly contrastive expressions |
| -ARG | - Type-identical <u>arg</u>uments of the same predicate. |
| -COMP | - Items occur in a <u>comp</u>arative construction. |
| -COORD | - Items are <u>coord</u>inated. |
| -EXT | - Items occur in different sentences – sentence-<u>ext</u>ernal contrast |
| SEL | Item <u>sel</u>ects one element from a pair or list of *previously* introduced alternatives. |

Table 2: Alternative-eliciting features

On the other hand, there are also triggers, e.g. focus-sensitive particles, which seem to necessarily associate with a contrastive focus (ALT-FSP).[28] 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 | | | | | | | | |

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)

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28. 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 from the list, 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 | – |

**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-COORD):**

(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.
*This was arranged by the party leaders Paisley and Adams at their first personal meeting in Belfast. Paisley will become the First Minister.*
(DIRNDL s1897, 26-03-2007, 20:00)

As we said, we are not 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 text allows 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.[29]

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.

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29. 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.

Consider Figure 5, showing a section from the context given in (51), in which a nuclear pitch accent occurs on the phrase *Ersten Ministers* ('First Minister').
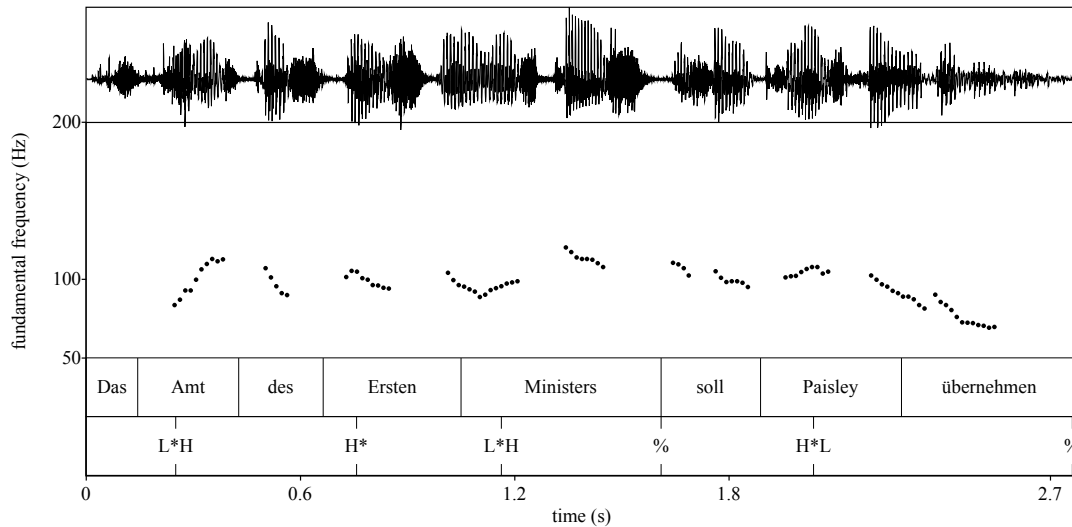


Figure 5: Optional contrast; DIRNDL s1897, 26-03-2007, 20:00, 04'05": *First Minister*

(51)    In Nordirland soll am 8. Mai eine gemeinsame Regierung aus protestantischen Union-
        isten und katholischer Sinn Féin die Arbeit aufnehmen. Darauf verständigten sich die
        Parteivorsitzenden Paisley und Adams bei ihrem ersten persönlichen Treffen in Belfast.
        ~[ALT-IMPLICIT Das AMT des [ERSten MiNISters]$_F$ %] soll **PAIS**ley übernehmen.
        *In Northern Ireland, a power-sharing government of the protestant unionists and the catholic*
        *Sinn Féin will start its work on May 8. This was arranged by the party leaders Paisley and*
        *Adams at their first personal meeting in Belfast. Paisley will become the First Minister.*

Knowing that the nuclear pitch accent is on *Minister* intuitively evokes the contrastive interpretation that the speaker assumed that other posts were also assigned. This is what we indicate by the ~ operator. Clearly, the version in Figure 5 is not the only way the sentence can be pronounced. Instead, the speaker might have chosen not to mark the contrast, thus simply producing a novelty focus as in (52).

(52)    [Das AMT des Ersten MiNISters soll   **PAIS**ley übernehmen.]$_F$
        the   post of  first    minister   shall Paisley   take

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 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

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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 $\kappa$-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 rather difficult task. 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 non-final intermediate phrases as well as pre- and postnuclear prominences.

| 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 (contrastively) *focussed* and *given* constituent. A counterexample is shown in (53b) (Büring, 2008, ms.) 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, 2008, ms.; 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 either be 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 provide a complete RefLex and elicited-alternatives annotation of the SOF example (6), which was introduced in Section 1.[30] We observe that the second occurrence of *vegetables* in (55) is embedded under other given constituents.

(54)

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

(55)

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

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 | | |
| | | (S) 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

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30. 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.

instead, following our intuitions, 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.[31] 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. (Implicit 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).

(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 Pro**VINZ**.
*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 (in press) 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

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31. 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)
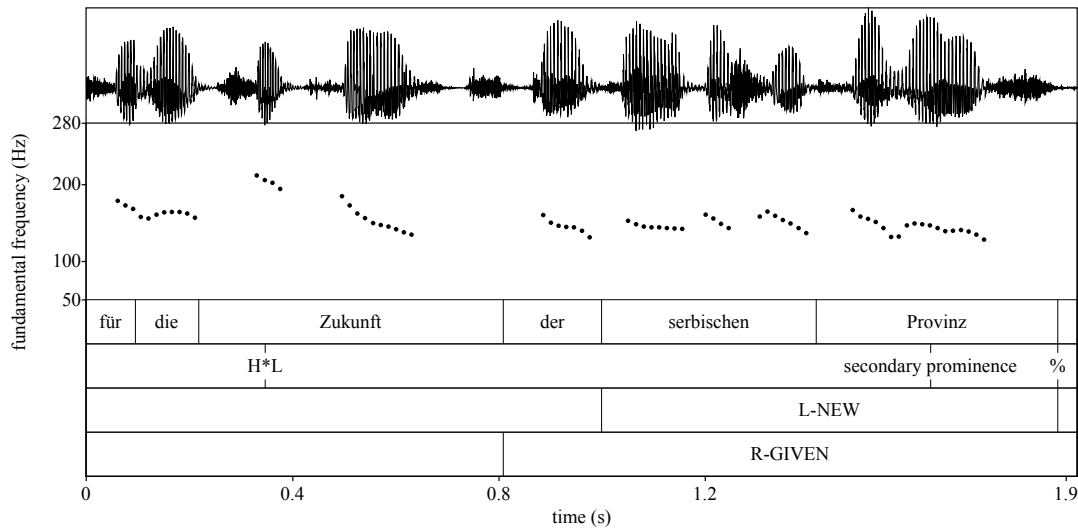  b. Last summer he reconSTRUCted [the shed]. (coreferential)

Figure 6: Realisation of an epithet (R-GIVEN, L-NEW); DIRNDL s1730, 26-03-2007, 17:00, 0'31":
*the Serbian province*

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
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 theo-
retical 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 is-
sues 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 $\sim$ 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 not-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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