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The notions of information structure

edited by

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Table of content

Introduction	1
Manfred Krifka: Basic Notions of Information Structure	13
Mats Rooth: Notions of Focus Anaphoricity	56
Katalin É. Kiss: Topic and focus: two structural positions associated with logical functions in the left periphery of the Hungarian sentence	68
Cornelia Endriss & Stefan Hinterwimmer: Direct and Indirect Aboutness Topics	82
Satoshi Tomioka: Information Structure as Information-based Partition	97
Dorit Abush: Focus Presuppositions	108
Elisabeth O. Selkirk: Contrastive focus, Givenness and the Unmarked Status of “discourse-new”	124
Malte Zimmermann: Contrastive Focus	147
Caroline Féry: The Fallacy of Invariant Phonological Correlates of Information Structural Notions	160
Carlos Gussenhoven: Notions and Subnotions of Information Structure	182
Gisbert Fanselow: The Restricted Access of Information Structure to Syntax – A Minority Report	195
Katharina Hartmann: Focus and Tone	212

Introduction

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1 Aim and content of the volume

The idea that various subsystems of the linguistic faculty interact with and through information structure has an ever growing influence on linguistic theory formation. While this development is very promising, it also involves the risk that fundamental notions are understood in a different way in different subfields, so that congruent results may only be apparent or cross-discipline generalization may be overlooked – dangers that are very real, as notorious examples of the past have shown.

The present volume is an attempt to minimize such risks. First, one of the editors, Manfred Krifka, has contributed an article in which he proposes precise definitions for the key notions of information structure and embeds his definitions into the context of the current debate. Second, we asked colleagues from the SFB 632 and external experts on information structure for short contributions shedding light on the notions of information structure from various perspectives by offering definitions and discussing the scope and nature of the fundamentals of information structure for their subfields. These contributions complement each other, in the sense that Krifka's proposal may be considered a frame for the other papers. But they should not be considered the final word of the SFB 632 on the notions of Information Structure. While the authors of the papers have discussed the notions of Information Structure intensively, they did not consult each other when writing their papers, and they were not even

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assigned particular topics within the area of information structure. This volume should be seen as an important step towards the development of a precise and comprehensive terminology, together with other work that has been done in the SFB, such as the development of the ANNIS annotation scheme and the QUIS questionnaire.

When we set out with the preparations for this volume, we were well aware of the risks of such an enterprise, but we are very satisfied with the results. It shows that information structural concepts are reflected by a multitude of different grammatical devices, with a very high degree of congruence among the different subdisciplines. It is this variety of grammatical tools which often blurs the coherence of the terminology.

Does the volume bring us closer to a definition of the information structural concepts then? We think that it does. Phonologists, syntacticians and semanticists turned out to speak about the same kind of objects when they use the terms 'focus' and 'topic', 'new' and 'given', and so on. In this sense, huge progress has been accomplished since Halliday's (1967-8) and Chafe's (1976) work in the sixties and seventies. Even the papers lacking pointed definitions implicitly use the terms in the same way as those which propose definitions.

Krifka's paper and the system of definitions he proposes will serve as a guideline for this introduction. **Rooth's** paper is firmly anchoring focus in the semantic tradition. His paper looks at phenomena like breadth of focus, scope of focus and focus anaphoricity. Definitions of focus and topic have been provided by **É. Kiss's** paper as well, though she restricts them to Hungarian. She argues that in Hungarian the first position in a sentence is a topic and is to be interpreted as the logical subject of predication and the preverbal position is the focus. It exhaustively identifies the set of entities for which the predicate denoted by the post-focus constituent of the clause holds. The presupposition of the paper might be that Hungarian uses information structural concepts in a

different way from other languages, an idea entertained also by Zimmermann. Endriss & Hinterwimmer's, Selkirk's, Tomioka's, Abush's and Zimmermann's papers concentrate on a number of specific problems of information structure and help to clarify difficult issues in the field. **Endriss & Hinterwimmer** give a semantic account for topic and propose a definition which is compatible with the topic-hood of certain indefinite noun phrases. **Selkirk's** paper considers two aspects of focus. First the phonology of contrastive focus, and second she proposes a tripartite syntactic marking: F-marking for contrastive focus, G-marking for discourse-given, and no marking for discourse-new. **Tomioka** has a different perspective. He questions the well-foundedness of the term 'structure' appearing in 'information structure' since there is only few hierarchical structure in the notions as they are commonly used. **Abush** asks whether focus triggers presuppositions and answers by the negative. **Zimmermann** examines contrastive focus from the point of view of hearer expectation. And finally, Féry's, Gussenhoven's, Fanselow's and Hartmann's papers are interested in the place information structure occupies in grammar, and in the grammatical reflexes of focus and topic. **Féry** denies the existence of phonological and syntactic categories specific for information structure, and proposes that languages only use devices for the expression of information structure that they have at their disposal anyway. **Gussenhoven's** passes review of focus types, focus sizes and focus realizations. The main emphasis of the paper lies on the structural devices encoding focus: morphosyntax, the use of particles, verbal morphology and phonology (pitch accents and prosodic phrasing). **Fanselow** denies that notions of information structure play a role in the identification of syntactic slots or categories, or in the triggering of syntactic operations. By contrast, **Hartmann** looks for correlates of information structure in the phonology, and gives an overview on some differences in the use of F_0 in intonation languages and tone languages.

2 Definitions

Manfred Krifka's paper provides clear and unequivocal definitions for 'focus', 'given' and 'topic'. Point of departure of his definitions is the content and management of the common ground (CG), which has been prominent in nearly all mentalistic and semantico-pragmatic accounts of information structure. The CG is the information which is believed to be shared and which is modified in the course of a conversation.

2.1 Focus

Krifka's general definition of focus, which leans on Rooth's (1985, 1992, this volume) *Alternative Semantics*, appears in (1).

(1) Focus

Focus indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions.¹

Krifka distinguishes between 'expression focus' and 'denotation focus.' Differences in meaning are only found in the latter kind of focus, on which we concentrate here. The pragmatic use of focus (or 'management of CG') does not involve any change in the truth-value of the sentence. Only the semantic use of focus (or 'content of CG') has such an effect. Pragmatic uses of focus includes answers to wh-questions, corrections, confirmations, parallel expressions and delimitations. Semantic uses of focus contain focus-sensitive particles (so-called 'association with focus' cases), negations, reason clauses and restrictors of quantifiers.

It is important to understand which subclasses of focus can be expressed by grammatical means, even if the distinction is only realized in a small group

¹ Rooth (1985, 1992, this volume) distinguishes between ordinary meaning and focus meaning of expressions.

of languages. In the SFB annotation guidelines, ‘focus’ is subcategorized into new and contrastive. New focus is further subdivided into new-solicited and new-unsolicited, and contrastive focus is partitioned into replacing, selection, partiality, implication, confirmation of truth-value, and contradiction of truth-value. In the annotation of the data in ANNIS, a distinction is made between wide (or broad) and narrow focus. It is still unclear whether all these categories are given distinctive grammatical correlates in natural languages, but the examination and comparison of natural data will help to answer this difficult question.

Rooth’s point of departure is the grammatical representation of focus, as introduced by Jackendoff (1972): the syntactic feature F links the phonological with the semantic representation of focus. He shows that the syntactic feature is not sufficient for the interpretation of focus, and that a semantic and pragmatic component is unavoidable. Rooth goes on with the question of the breadth of the F feature: Pitch accent and prosodic phrasing may be ambiguous. A more difficult question relates to the scope of focus. If a constituent in an embedded clause has a pitch accent, in which circumstances does it stand for a focus having scope on the matrix sentence, as well? In this case, just postulation a syntactic F feature is not enough, and what Rooth calls ‘focus skeleton’ (Jackendoff’s presupposition) is needed. Focus anaphoricity and focus interpretation establish a relation between the focus and the context in which the sentence containing it is inserted.

Selkirk concentrates on English and has no doubt that a contrastive focus is expressed differently from informational focus. In phonology, different phonetic correlates are active in these cases, and the contrastive focus must be more prominent than other constituents in the sentence. In syntax, the marking of focused constituent must also make a distinction between different types of focus. **Zimmermann** also considers contrastive focus, but in a crosslinguistic

semantically-oriented perspective. According to him, contrastive focus cannot be accounted for in familiar terms like ‘introduction of alternatives’ or ‘exhaustivity,’ but rather discourse-pragmatic notions like ‘hearer expectation’ or ‘discourse expectability’ must enter the definition of this notion.

2.2 Topic

Let us again start this section on the definition of topic with Krifka’s definition in (2).

(2) Topic

The topic constituent identifies the entity or set of entities under which the information expressed in the comment constituent should be stored in the CG content.

The notion of topic is best understood as a kind of address or file card which specifies the individual or set about which the remainder of the sentence makes a comment (see Reinhart 1981 for such a concept of topicality). It has no truth-conditional effect except that it presupposes the existence of that individual. In this sense, the complement of ‘topic’ is ‘comment’, which can itself be partitioned into a focused and an backgrounded part. Sentences usually have only one topic, but can also have none, or more than one.

Following Jacobs (2001), topics can be aboutness or frame-setting topics, and the means to express a topic in the grammar can be pinpointed rather precisely in terms of which syntactic and intonational preferences the topic displays, at least in an intonation language. But, according to Féry’s theses, none of these properties are definitional for topic. Rather they express preferences as to how a ‘good’ topic has to be realized (see also Jacobs 2001 for a similar view).

Very prominent in the research about topic is the question of the kinds of expressions which are prototypical topics. In **Endriss & Hinterwimmer**'s view, topics serve as the subject of a predication, and do not need to be familiar (in contradistinction to Prince's 1981, or Lambrecht's 1994 definitions of topic). Consequently, not only proper names, definite descriptions, and pronouns can be good topics, but also a sub-class of indefinite expressions. Indefinite topics are semantically combined with the comment by making use of their 'minimal witness set' (Barwise & Cooper 1981).

Contrastive topics have figured prominently in the agenda of researchers working on information structure, especially in the last few decades. They come in two varieties, as parallel expressions, and as implicational topics. Krifka's examples are reproduced in (3) and (4). Krifka analyzes contrastive topics as focus within a topic, since a contrastive topic typically implies that there are alternatives in the discourse.

- (3) A: What do your siblings do?
 B: [My [Sister]_{Focus}]_{Topic} [studies MEDicine]_{Focus},
 and [my [BROther]_{Focus}]_{Topic} is [working on a FREIGHT ship]_{Focus}.
- (4) A: Where were you (at the time of the murder)?
 B: [[I]_{Focus}]_{Topic} [was [at HOME]_{Focus}]_{Comment}

Worth mentioning at this place is a paper by Frascarelli & Hinterhölzl (2006) who distinguish between aboutness, contrastive and familiarity topics and who show that at least in Italian and in German, these are ordered in this order. This does not seem to be true for languages like Japanese or Chinese, or other tone languages, though, in which topics are mostly 'external'. In these languages, the order of more than one topic, does not seem to be pragmatically conditioned.

In the SFB annotation guidelines, topic is divided into aboutness and frame-setting. In the database of D2 (ANNIS), further categories are introduced:

familiarity, implication and contrastivity. Again, it is an empirical issue whether all distinctions are found in natural languages.

2.3 New/Given

A third concept addressed by Krifka is givenness. Following the tradition introduced by Schwarzschild (1999), he does not treat it on a parallel with 'new'. In (5), Krifka's definition of givenness is reproduced.

(5) Givenness

A feature X of an expression α is a Givenness feature iff X indicates whether the denotation of α is present in the CG or not, and/or indicates the degree to which it is present in the immediate CG.

Givenness is a different notion from focus, as it may well be the case that a focused constituent is given in the discourse, as is exemplified by second occurrence focus for instance.

Krifka correlates givenness with anaphoricity in syntax and deaccenting in phonology, and shows that the preference for accenting arguments rather than predicates can come from the urge of making a distinction between new and given referents, which is more important for arguments than for heads. This is a powerful hypothesis which needs more investigation in the future.

Selkirk also attributes an important place to givenness, especially as it creates additional layers of accenting through second occurrence focus (SOF).

Abush examines the important question of whether existential presupposition is an obligatory part of focus interpretation and comes to a negative answer. She shows that compositional semantics of conditional and negated clauses, traditionally used to check the presence of existential presuppositions, do not necessarily trigger existential presuppositions in a

sentence with a focus or a topic accent, and she argues that a treatment of these cases in terms of givenness should be preferred.

The annotation guidelines distinguish between categories of givenness found in Prince (1981), Givón (1983) and Lambrecht (1994): given-active, given-inactive, accessible, situationally accessible, aggregation, inferable, general and new. Again it is an empirical issue whether languages distinguish between these categories.

3 The ‘structure’ of information structure

Tomioka’s paper addresses the following central question: does the relation between information structure concepts ever involve interesting and complex structural aspects, such that the use of the term information *structure* is really warranted? Traditionally, binary oppositions are used: focus is opposed to background, topic to comment, new to given, theme to rheme, etc., but these oppositions are envisaged as orthogonal to each other. Tomioka has a conservative view of the success of establishing an information structural hierarchy, but finds two places in which a hierarchy can be established, albeit of a different kind: topics can be embedded into each other, as evidenced by Japanese topic constructions, and foci can also be so in SOF types of structure.

The problem can be illustrated by means of an example. The question ‘Who introduced Willy to Mimi? Ingrid or Iris?’ may be answered with an exhaustivity marker, like a cleft sentence ‘It was Ingrid.’ It is a special case of alternative semantics, in which the alternatives are given in the preceding question. In a semantic perspective, a contrast, or an exhaustive focus is not hierarchically superior to alternative semantics, but is rather a special case. And of course, *Ingrid* has been mentioned, so that it is given.

However, some partial hierarchies are located in different parts of the grammar. In the phonology, a progression can be established when going from ‘backgrounded’ and unaccented referents, to a referent which is informationally new and attributed a pitch accent, and finally to a referent which takes part in a contrast or a parallel construction, given or not. In this latter case, the pitch accent may be realized with a boost of F_0 (Selkirk 2002; Baumann & Grice 2006).

It is also the case that finer distinction may be needed like those found in Second Occurrence Focus, in which a focus is given and new at the same time, or in embedded foci, where a contrastive focus is embedded in an informational focus. Association with focus (*only, also, even*, quantification adverbs and the like) may also be a special kind of focus embedding.

4 Reflexes of information structure

A recurrent question in many papers of this volume and in the research about information structure addresses the place that information structure occupies in grammar. It is important to distinguish the mechanics of the grammatical computation from the properties of resulting linguistic objects. As for the realization of information structure, **Féry** proposes that languages enhance the grammatical reflexes that they have at their disposal anyway. In this view, there is no phonological or syntactic reflexes reserved solely for information structure. A language with lexical stress enhances exactly this position, but a tone language may choose to express information structure with particles or with different word order, because its grammar provides these solutions independently from information structure.

Gussenhoven shows that it is necessary to distinguish between broad and narrow focus on the one hand and between the kind of focus (at least

informational vs contrastive) on the other hand, before studying the grammatical devices that languages use to encode information structure. With examples from Basque, Wolof, Japanese, Sundanese, Portuguese and Bengali, he shows that languages make important distinctions in the way they realize the two kinds of focus. Interestingly, they all use the same device for both kinds of focus, but in different ways. Japanese and Sundanese use different particles, Wolof different verb morphology, Portuguese different kinds of pitch accents. All vary the prosodic phrasing along with the other devices, a fact pointing at the universality of prosodic phrasing as a way of signaling focus.

Hartmann concentrates on the realization of prosodic prominence as a result of focus and proposes that languages use tone, intonation and/or prosodic phrasing for the signaling of information structure.

Finally, **Fanselow** proposes that syntax should be information-structure free, in the sense that the computational part of syntax does not refer to positions and processes directly linked to information structure, as proposed, e.g., by Rizzi (1997). A focus or a topic does not move because it is informationally-marked, but for independent reasons, related, e.g., to the presence of formal features in the syntactic structure. In Selkirk's view, by contrast, the syntactic structure of information structure is expressed by features directly attributed to syntactic constituents.

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Basic Notions of Information Structure

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Abstract. This article takes stock of the basic notions of Information Structure (IS). It first provides a general characterization of IS following Chafe (1976) within a communicative model of Common Ground (CG), which distinguishes between CG content and CG management. IS is concerned with those features of language that concern the local CG. It then defines and discusses the notions of Focus (as indicating alternatives) and its various uses, Givenness (as indicating that a denotation is already present in the CG), and Topic (as specifying what an statement is about). It also proposes a new notion, Delimitation, which comprises contrastive topics and frame setters, and indicates that the current conversational move does not satisfy the local communicative needs totally. It also points out that the rhetorical structuring partly belongs to IS.

Keywords: Information Structure, Focus, Topic, Givenness, Contrast

1 Introduction

The basic notions of Information Structure (IS), such as Focus, Topic and Givenness, are not simple observational terms. As any scientific notions, they are rooted in theory, in this case, theories of how communication works. Hence this paper necessarily will make certain theoretical assumptions, without going into great details. I will motivate the selection of IS notions in the tradition of Chafe (1976) who talked about IS as a phenomenon of information packaging that responds to the immediate communicative needs of interlocutors. I do this within the model of communication as continuous change of the common ground (CG), where it will be crucial to distinguish between CG content and what I will call CG management.

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IS is a vast topic of research that has been pursued within different theoretical frameworks, and has produced numerous empirical insights. This short paper cannot conclusively argue for its choices in detail, vis-a-vis other theoretical options, or attempt to motivate them by considering phenomena in a wider range of languages. In spite of this, I hope that a coherent and attractive theoretical landscape emerges for IS research.

2 Preliminaries

2.1 What is Information Structure?

In his seminal paper on notions of IS of 1976, Chafe introduced the notion of **packaging** of the information conveyed in an utterance that, to my mind, still provides useful guidance for our understanding of IS. Chafe wisely restricted his notion of IS to those aspects that respond to the **temporary** state of the addressee's mind, thus excluding several other aspects of messages, like reference to long-term background knowledge, choice of language or level of politeness that otherwise could be understood as packaging as well.

One problem with Chafe's approach is that there are aspects of optimization of the message that, on the one hand, respond to the temporary state of the addressee, but on the other also affect the message itself, and hence cannot be treated as pure packaging. For example, Focus, as expressed by sentence accent in English, can be used for information packaging, as in answers to questions, cf. (1), but can also lead to truth-conditional differences, as when associated with focus-sensitive particles like *only*, cf. (2).

- (1) a. A: What did John show Mary?
 B: John showed Mary [the PICTures]_F.
- b. A: Who did John show the pictures?
 B: John showed [MARy]_F the pictures.

-
- (2) a. John only showed Mary [the PICTures]_F
 b. John only showed [MARY]_F the pictures.

The truth conditions of B's answers in (1) arguably are the same, whereas the truth conditions of (2) differ. One and the same linguistic device, sentence accent, can be used for packaging as well as for constructing the content. There are two possible ways of dealing with this multiple use of features such as accent: One is to assume that the two uses of the same feature are essentially unrelated, just as the uses of accent in English to express focus and to distinguish words such as *REcord* and *reCORD*. The other is to assume that the feature is to be interpreted in a particular way that makes sense for the purposes of information packaging and of building information content. For methodological reasons the second way appears to be more attractive: If it can be shown that one and the same interpretation of a feature has multiple uses, then this should be assumed in favor of multiple interpretations. We will see that focus indeed can be interpreted in this way.

2.2 Common Ground: Content and Management

If we are to talk about communication as transfer of information and its optimization relative to the temporary needs of interlocutors, it is useful to adopt a model of information exchange that makes use of the notion of **Common Ground**. The original notion of CG (cf. Stalnaker 1974, Karttunen 1974, Lewis 1979) saw it as a way to model the information that is mutually known to be shared and continuously modified in communication. This allowed for a promising way of modeling the distinction between **presuppositions**, as requirements for the input CG, and assertions or the **proffered content**, as the proposed change in the output CG. This distinction is relevant for information packaging, as the CG changes continuously, and information has to be packaged in corre-

spondence with the CG at the point at which they are uttered. For example, it can be explained why (3.a) is fine but (b) is odd: In (a), the first clause introduces the information that the speaker has a cat, to which the presupposition of the second clause appeals. This contrasts with (3.b), as the second sentence introduces the information that the speaker has a cat which is already present in the input CG at this point (cf. van der Sandt 1988).

- (3) a. I have a cat, and I had to bring my cat to the vet.
 b. #I had to bring my cat to the vet, and I have a cat.

Already when the notion of CG was introduced, it was pointed out that speakers could change CG by **accommodation** of presupposition. That is, uncontroversial facts could be added implicitly to the CG by requiring the input CG to be of a certain kind. This is why (4.a) is good but (b) is bad:

- (4) a. I had to bring my cat to the vet because it was sick.
 b. I had to bring my gorilla to the vet because it was sick.

The notion of CG had first been applied to factual information, but it soon got extended to discourse referents (in particular, by Kamp 1981 and Heim 1982). That is, CG does not only consist of a set of propositions that is presumed to be mutually accepted (or the conjunction of this set, one proposition), but also of a set of entities that had been introduced into the CG before. Such entities can be explicitly introduced, e.g. by an indefinite NP, or they can be accommodated, as in (4.a). They can be taken up by pronouns, as in the second clause of (4.a), or by definite NPs, which express requirements to the input CG. The choice of anaphoric expression depends on the recency of the antecedent, again a notion that falls squarely within Chafe's notion of packaging.

The properties of CG mentioned so far all had to do with the truth-conditional information of the CG, and so we can subsume them under the heading of **CG content**. But any ecologically valid notion of CG must also contain information about the manifest communicative interests and goals of the participants. For example, questions typically do not add factual information to the common ground, but indicate informational needs on the side of one participant that should be satisfied by a conversational move of the other. I propose to call this dimension of the common ground **CG management**, as it is concerned with the way how the CG content should develop. As with CG content, CG management is supposed to be shared, with the understanding that the responsibility for it may be asymmetrically distributed among participants. There is a wide variety of studies that can be captured under the notion of CG management, some formal such as Merin (1994) or Groenendijk (1999), some less formal such as Clark (1996) and studies of Conversational Analysis such as #. The distinction is important for our purposes, as we can associate those aspects of IS that have truth-conditional impact with CG content, and those which relate to the pragmatic use of expressions with CG management.

2.3 Expressions and what they stand for

Before we discuss specific notions of IS, I would like to mention a terminological problem. We often find that the distinction between an expression and what it stands for, its denotatum, is not made. For example, in a sentence like (5), the expression *as for the beans*, or *the beans*, may be called the ‘topic’ of the sentence, but also the beans referred to are called its ‘topic’.

(5) As for the beans, John ate them.

For some reason, this confusion of expression and meaning occurs particularly often for IS notions. For notions like ‘subject’, ‘predicate’ or ‘direct object’ it

does not arise; no one would claim that John the person is the grammatical subject of (5), it is *John* the noun phrase. The imprecision of IS terms can be endured if one is aware of it. But in any instance in which it is relevant, it is important to make the intended interpretation clear. For example, we can speak of (*as for*) *the beans* as the ‘topic constituent’ of the sentence, or as a ‘topic expression’, and of the beans that it refers to, or of the discourse referents anchored to them, as the ‘topic referents’ or ‘topic denotation’.

3 Focus

3.1 What is Focus?

The most successful understanding of focus, to my mind, is the following definition, which will be made more precise presently.

- (6) **Focus indicates the presence of alternatives that are relevant for the interpretation of linguistic expressions.**

This is the central claim of Alternative Semantics (Rooth 1985, 1992).¹ The rather general definition does not say anything how focus is marked; in fact it is compatible with different markings. However, it says that we should use terms like “focus marking” or “focus construction” only to indicate that alternatives play a role in interpretation. It might well be that different ways of focus marking signal different ways of how alternatives are exploited; e.g. focus marking by cleft sentences often signals an exhaustive interpretation that in-situ focus lacks. We can then talk about subtypes of focus, such as cleft focus and in-situ focus, that may employ the alternatives in more specific ways. Also, (6) allows for languages to differ in the ways they mark focus and in the specific interpretational effects of focus. This is in no way different from other linguistic

¹ But it is not necessarily tied to the precise representation of focus that this theory proposes.

categories, such as Case or Gender. But it seems reasonable, and consistent with current uses of the term, to use “Focus” exactly in those cases that satisfy (6).

²The following sections will show that all current uses of the term can be subsumed under (6).

3.2 Expression Focus and Denotation Focus

Definition (6) is silent about the nature of the alternatives that are relevant for interpretation. In fact, the alternatives may be alternatives of form or of denotation. This suggests the following way to make (6) more precise:

- (7) **A property F of an expression α is a Focus property iff F signals**
(a) that alternatives of (parts of) the expression α or
(b) alternatives of the denotation of (parts of) α
are relevant for the interpretation of α .

I call the first case, (a), **expression focus**. The expression alternatives can affect a variety of aspects, like choice of words and pronunciation, and they do not even have to involve constituents or meaningful units. Focus on expressions is typically used for corrections, and often but not necessarily comes with an overt negation (cf. Horn 1985 on metalinguistic negation). Two examples:

- (8) Grandpa didn't [kick the BUCKet]_F, he [passed aWAY]_F.
- (9) A: They live in BERlin.
 B: They live in [BerLIN]_F!

² It should be pointed out that there are cases in which alternatives play a role that are not indicated by focus. For example, the standard theory of scalar implicatures assumes that they arise due to alternatives to an expression ordered by a Horn scale, and these alternatives do not have to be focused. For example, *John or Mary will come* implicates that not both will come as *or* has *and* as its alternative, but clearly, *or* does not have to be focused.

In (8) the relevant alternatives of both foci are the expressions *{kick the bucket, pass away}*. It cannot be their denotations, as they are identical, the property DIE. The expressions differ among other things in their connotations, which is the feature in which they are contrasted here, so what is contrasted cannot just be their denotation. In (9) the relevant alternatives are the expressions *{BERlin, BerLIN}* that only differ in their accent, and speaker B corrects speaker A by supplying the form that A thinks has the right accent structure.

Expression focus is typically marked in-situ, not by clefts or other types of movement. It can focus on constituents below the word level, and it can be deeply embedded within a sentence. This follows from the assumption that expression focus affects surface representations of linguistic objects. The typical use of expression focus is the rejection of a string $[\alpha_1 \dots \alpha_{i,F} \dots \alpha_n]$ in favor of a string $[\alpha_1 \dots \alpha_{i,F'} \dots \alpha_n]$, where focus identifies the substring to be replaced and its replacement.

I will call the second case, (b), **denotation focus**. Here the relevant alternatives are construed on the level of denotations, leading to alternative denotations of complex expressions. Denotation focus on an expression α with meaning $\|\alpha\|$ leads to the assumption of a set of alternative meanings that play a role in the interpretation of the constituent in which α occurs. The alternative denotations have to be comparable to the denotation of the expression in focus, that is, they have to be of the same type, and often also of the same ontological sort (e.g., persons or times), and they can be more narrowly restricted by the context of utterance.

In the following, I will concentrate on denotation focus, which is certainly more important in communication.

3.3 Semantic vs Pragmatic Uses of Focus: CG content vs. CG management

We now turn to the notion of interpretation of the linguistic expression α that figured in definition (7). It is useful to explicate this notion within the general theory of Common Ground (CG) introduced in section 2.2, where we introduced the distinction between CG content and CG management. This differentiation is useful to distinguish between two quite different uses of focus: So-called **pragmatic** uses of focus relate to the public communicative goals of the participants, the CG management, whereas so-called **semantic** uses of focus relate to the factual information, the CG content.

The pragmatic use of focus does not have an immediate influence on truth conditions, but it helps in guiding the direction into which communication should develop, and it also aids in building the cognitive representations that are to be constructed by the interlocutors. Failing to select the right focus typically results in incoherent communication. The semantic use of focus, on the other hand, affects the truth-conditional content of the CG. Failing to set focus right will result in transmitting unintended factual information. The two uses of focus cannot always be neatly separated, but there are prototypical cases that clearly belong to the one or to the other category, to which we now turn.

3.4 Pragmatic uses of focus

The classical pragmatic use of focus is to highlight the part of an answer that corresponds to the *wh*-part of a constituent question (Paul 1880). This can be captured in a straightforward way within our model of CG change.

A question changes the current CG in such a way as to indicate the communicative goal of the questioner. Following Hamblin (1973) we can model this effect by interpreting a question as a set of propositions, each being the denotation of a congruent answer.

(10) A: *Who stole the cookie?*

Hamblin meaning: $\{\text{STOLE}(\text{COOKIE})(x) \mid x \sqsubseteq \text{PERSON}\}$

The answer identifies one of these propositions and adds it to the CG content; this is the job of the “ordinary meaning” in Alternative Semantics. Focus induces alternatives that correspond to the Hamblin meaning of questions; in the theory of Rooth (1992), the alternative set is a superset of the question set:

(11) B: $[\text{PEter}]_F$ stole the cookie.

Ordinary meaning of the answer: $\text{STOLE}(\text{COOKIE})(\text{PETER})$

Focus-induced alternatives: $\{\text{STOLE}(\text{COOKIE})(x) \mid x \sqsubseteq \text{ENTITY}\}^3$

The formation of the question, as well as the construction of the focus-induced alternatives of the answers, clearly belongs to CG management, not to CG content. The question specifies the way in which the CG should develop in the immediate future; the answer relates an expression to the immediately preceding context. Obviously, focus in answers is an information-packaging device in the sense of Chafe, as it corresponds to the current CG, and the formation of questions, as a device of CG management, can be seen as part of information packaging as well.

We might ask at this point why there is marking of question-answer congruence in the first place. Its *raison d'être* most likely is that it allows to accommodate the meaning of the questions that are not overtly expressed. That is, it allows to accommodate CG management. For example, the accent structure in (12) can be understood in such a way that the second clause leads to the accommodation of a question, *what did you do first*.

³ The focus is not restricted to PERSON, different from the question (10), in which the wh-word *who* enforces this restriction.

- (12) I built a St. Martin's lantern with my kids. First, I [built the BODY of the lantern with some CARDboard paper]_F.

A variety of theories have assumed that coherent discourse is structured by such implicit questions (e.g. Klein & von Stutterheim 1987, van Kuppevelt 1994, Roberts 1995, Buring 2003), and focus on the answers to such explicit questions may well help the addressee to construct what the intended questions were.⁴ Under this understanding, all cases of so-called “presentational” or “information” focus which claimed that focus expresses the most important part of the utterance, or what is new in the utterance, can be subsumed under the use of alternatives to indicate covert questions suggested by the context. The following examples suggest questions like *What happened?*, *What was there?* and *What did she do?*, which explains the types of foci suggested for the second clauses.

- (13) a. And then something strage happened. [A MEterorite fell down]_F.
 b. Once upon a time, there was [a PRINcess]_F
 b. Mary sat down at her desk. She [took out a pile of NOTes]_F.

Other pragmatic uses of focus is to **correct** and **confirm** information. In cases like (14.B,B') the focus alternatives must include a proposition that has been proposed in the immediate preceding CG. It is expressed that the ordinary meaning is the only one among the alternatives that holds. This leads to a corrective interpretation in case the context proposition differed, cf. (B), and to a confirmative interpretation in case the context proposition was the same, cf. (B').

⁴ It should be stressed that we should not expect this use of focus to be universal; just as some languages use gender information to express pronoun binding and others don't, the use of focus to mark Q/A-coherence may be restricted. Findings about languages such as Hausa (Hartmann & Zimmermann, to appear) and Northern Sotho (Zerbian 2006) suggest that this is the case.

In the latter case the wider CG must be such that other alternatives are under consideration as well, which are then excluded. Again, focus in this use restricts the possible contexts, and presumably aids interpretation.

- (14) A: Mary stole the cookie.
 B: (No,) [PEter]_F stole the cookie!
 B': Yes, [MAry]_F stole the cookie.

Another pragmatic use of focus is its use to highlight **parallels** in interpretations. This can affect whole clauses as in (15.a) or parts of clauses as in (b). As in the previous cases, focus creates alternatives, with the pragmatic requirement that some of these alternatives are also evoked in the immediately surrounding contexts. In addition, the parallel expressions are required to have the same set of alternatives. In the case of (15.a), both clauses evoke the set $\{\text{STOLE}(x)(y) \mid x, y \in \text{ENTITY}\}$. In the case of (b), the alternatives have to be constructed more locally, for which Rooth (1992) introduces an anaphoric operator *C*, here presumably at the level of the NP or DP. The NP-level alternatives are $\{\text{P}(\text{FARMER}) \mid \text{P} \in \text{NATIONALITY}\}$, a set of predicates like *AMERICAN(FARMER)*, *CANADIAN(FARMER)*, etc.

- (15) a. *Mary stole the COOkie and PEter stole the CHOcolate.*
 b. *An AMERican farmer talked to a CaNAdian farmer, ...*

The use of focus to express parallel structures is perhaps one of the least understood aspects of focus. Focus appears to be less obligatory here than in the other cases. Presumably focus assists in constructing mental models of the described scene by associating the contrasted meanings.

Yet another pragmatic use of focus is to make the addressee aware of a **delimitation** of the utterance to the constituent in focus. This use subsumes, in

particular, cases of contrastive topics such as *John* in I will come back to this in section 6.2

(16.a), but also focus in frame setting expressions as in (b). I will come back to this in section 6.2

- (16) a. As for JOHN, he was seen in the KITchen.
b. In MY opinion, JOHN stole the cookies.

With these types (answers, including selections from a list of items specified in the question, corrections, confirmations, parallels, and delimitation) we have covered the main pragmatic uses of focus. We turn to those uses of focus that have an immediate truth-conditional effect, that is, that directly influence CG content.

3.5 Semantic Uses of Focus

We say that semantic operators whose interpretational effects depend on focus are **associated** with focus. The best-known cases are focus-sensitive particles like *only*, *also* and *even*. There exist a variety of theories for the meaning of such particles, but they generally resort to the notion of alternatives, which was also central for the pragmatic uses of focus. In the case of exclusive particles like *only*, it is stated that the focus denotation is the only one among the alternatives that lead to a true assertion; additive particles like *also* express the presupposition that the assertion holds for other alternatives; and scalar particles like *even* presuppose that the denotation of the focus constituent is extreme when compared to other alternatives (cf. e.g. Jacobs 1983, König 1991).

But do these particles indeed affect the truth-conditional meaning? It is interesting to note that the focus information of additive and scalar particles does not affect the output CG, but rather restricts the input CG, as the alternatives are used to impose presuppositions. In particular, additive particles are close to a use

within CG management, as they indicate that a proposition with an alternative to the item in focus had been expressed before or is part of the CG.

(17) [JOHN]_F stole a cookie, and [PEter]_F, TOO⁵, stole a cookie.

Negation has been analyzed as a focus-sensitive particle as well. Presumably these cases can be subsumed under corrections, and hence they might rather belong to CG management use of focus. In the following example, it is negated that Bill stole the cookie, with the contextual requirement that precisely this has been claimed or appears to be inferrable.

(18) Not BILL_F stole the cookie, but JOHN_F.

But there are a number of clear cases in which alternatives are used for semantic purposes. For example, reason clauses as in (19), a variation of a counterfactual example of Dretske (1972), or operators like *fortunately*, necessarily contrast alternatives with each other.

(19) $\left\{ \begin{array}{l} \text{Clyde had to marry [BERtha]}_F \\ \text{Clyde had to [MARry]}_F \text{ Bertha} \end{array} \right\}$ in order to be eligible
for the inheritance.

(20) Fortunately, Bill spilled [WHITE]_F wine on the carpet.

For example, (20) says that among the two alternatives, JOHN SPILLED RED WINE and JOHN SPILLED WHITE WINE, the latter one was more fortunate (but of course that wine was spilled at all was still unfortunate).

Rooth (1985) has suggested that focus helps in determining the restrictor of quantifiers, in particular adverbial quantifiers, and then has truth-conditional impact as well. For example, focus has truth-conditional impact in (21); focus on

⁵ As for a theory that explains accent on *too*, cf. Krifka (1999).

q instead would result in the different, and false, reading that every u is followed by a q .

- (21) In English orthography, a $[U]_F$ always follows a q .
 ‘Whenever a q follows an $\{a, b, c, d, \dots z\}$, then it follows a u .’

One important fact about focus-sensitive operators is that they have to be in a position in which they can scope over their focus. For example, *only* in (22) could associate with *Mary*, with *Sue*, with *introduced* or with the whole VP, but not with *John* as it does not c-command *John* on any level of representation.

- (22) John only introduced Mary to Sue.

Yet it should be stressed that the notion of focus does not coincide with the notion of scope. For example, while the focus of *only* in (23.a) and (b) is the same, their scopes differ, leading to distinct interpretations.

- (23) a. Mary only said that JOHN stole a cookie.
 ‘Mary didn’t say of anyone but John that he stole a cookie.’
 b. Mary said that only JOHN stole a cookie.
 ‘Mary said that nobody but John stole a cookie.’

It is conceivable that semantic uses of focus can be traced back to pragmatic uses. The underlying idea is as follows: The notion of alternatives to what is said was first introduced for pragmatic purposes, to convey additional meanings by making explicit that certain expressions were considered but not uttered, presumably because they were false or not informative enough. Once established, alternatives were used for operators that, due to their meaning, required reference to sets of denotations. In some cases, like additive particles and contrastive negation, this change from pragmatic exploitation of alternatives to

semantic exploitation appears to be quite plausible; in other cases, as in (20) and (21), the details of such a development are considerably less clear. Such change from pragmatics to semantics is a common phenomenon that can be observed in the development of word meaning (cf. Levinson 2000 for pragmatically induced changes) and the semantization of implicatures (cf. Chierchia 2004).

It might be suggestive to distinguish between pragmatic and semantic focus by stating that the latter type of focus associates with an operator, while the former does not. But then we can assume illocutionary operators such as assertion or denial that make use of the alternatives introduced by focus, and we can say that focus is bound to such operators (cf. Jacobs 1984), hence this is not a valid criterion to distinguish between pragmatic and semantic uses.

3.6 Comparison with Alternative Notions of Focus

The notion of focus has been explicated in a variety of ways, in particular as “highlighting” the “most important” or “new” information in an utterance. While such explications are intuitively appealing and may apply to a majority of cases, I consider them unsatisfactory as definitions. The notion of highlighting is a particularly unclear one that is hardly predictive as long as we do not have a worked-out theory what highlighting is. I am also not aware of any worked-out theory of communication that has made clear what “importance” means, let alone one that has introduced a graded notion of importance. Even on an intuitive level, the notion of importance is difficult to apply. In which sense is *John* the most important part in (24)? Isn’t it most important that someone else stole the cookie?

(24) It wasn’t JOHN who stole the cookie.

As for the third, the notion of “newness” has been defended most often in quite different frameworks, ranging from Halliday’s “information focus” (cf.

Halliday 1967) to the Prague school (Sgall e.a. 1987) and to Jackendoff (1972). But it clearly gives us wrong predictions. There are many cases in which a constituent that refers to something mentioned previously is in focus. One might say that what is new in (25) is not John, or the expression *John*, but the information that John satisfies the description *x stole the cookie*.

- (25) A: Who stole the cookie, John or Mary?
B: JOHN stole the cookie.

When Jackendoff (1972) defines as “information focus” the information that is not shared by speaker and addressee, then we must say something like the following: It is shared information in (25) that John or Mary stole the cookie. The difference to what the sentence says, that John stole the cookie, is a more specific proposition. But not just any more specific proposition would do; it must be one that is more specific in a particular dimension, indicated by the focus. This leads to the idea that focus indicates an existential presupposition (cf. Geurts & van der Sandt 2004). If we have a sentence with a focus, [... α_F ...], then this sentence comes with the presupposition $\exists x$ [... x ...], where x replaces the denotation of α in the representation of the denotation of [... α_F ...]. For example, (24) and (25) presuppose that someone stole the cookie, and in many other types of uses of focus we plausibly can assume existence presuppositions. But existence presuppositions do not arise with every use of focus, as in the following examples:

- (26) Not even MARY_F managed to solve the problem.

- (27) A: Who, if anyone, has solved this problem?
B: NOone_F solved this problem.

If focus indicates the presence of alternatives, as suggested here, we can see why the other explanations made sense to some degree. The focus denota-

tion typically feels highlighted because it is contrasted with the other alternatives; the selection of this denotation over alternative ones is often felt to be the most important contribution in a sentence; and the selected alternative is often also new (not mentioned previously). Also, in many cases it is already established in the CG content that the proposition applies to one alternative, but it is still open to which one. But this does not mean that highlighting, importance, newness, or presupposition of existence should be figure in the definition of focus. These are statistical correlations, but not definitional features, of focus. Using them to define focus is similar to using the notion of definiteness to define subjects: The great majority of subjects in running text is definite, but in many languages indefinite subjects are allowed.

3.7 Further Focus Types

I have argued that focus in general indicates the presence of alternatives for interpretation. Subtypes of focus then all are variations of this underlying idea. We have distinguished between expression focus and denotation focus according to the nature of the items in focus, and we have distinguished between pragmatic focus and semantic focus according to the general ways in which focus-induced alternatives are used – whether they make a truth-conditional difference or not. There are a number of additional criteria that can be applied to classify either the kind of alternatives or their use.

Starting with the type of alternatives, we have have seen that constituents of different sizes can be put into focus: whole sentences, constituents like VPs or DPs, parts of DPs like adjectives or demonstratives. Sometimes terms are used like **broad** and **narrow** focus (cf. Selkirk 1984, Lambrecht 1994), but it should be clear that these are imprecise terms that can only be applied when different focus alternatives are under discussion. The position of the accent is determined by rules of accent percolation (also known as “focus projection”),

which leads to well-known ambiguities of focus marking (cf. Gussenhoven 1983, 1992, Selkirk 1984, 1995). For example, if a transitive VP is in focus, then accent is realized on the argument, which also would signal narrow focus on the argument. For denotation focus it holds that whatever is in focus must be a meaningful unit, as denotational focus contrasts different meanings. An extreme case is so-called **verum focus**, focus on the truth value of a sentence, which may be expressed by accenting an auxiliary (as in *She DOES like broccoli*). It is an interesting issue whether **parts of words** can be put in focus. Paul (1880) has proposed this for a word like *fahren* ‘to move in a land-bound vehicle’, where according to him it is possible that only the manner component is in focus, which is phonologically indistinguishable from focus on the whole denotation. I think that cases like this do not force us to lexical decomposition; we can also assume that the alternatives are restricted to denotations of verbs of locomotion like *fahren*, *gehen*, *reiten*. Another type of sublexical focus is illustrated in *We only saw stalagMITes in the cave, no stalagTITes*, where accent highlights a part does not carry meaning. As Artstein (2003) argues, this can be explained by a principle that accent creates a maximally distinct representation between the focus and its alternatives.

It sometimes happens that one operator makes use of a combination of foci, resulting in **complex focus**:

(28) John only introduced BILL to SUE.

This says: The only pair $\langle x, y \rangle$ such that John introduced x to y is $\langle \text{BILL}, \text{SUE} \rangle$. It cannot be reduced to single foci; in particular, the sentence means something different from the following:

(29) John only introduced BILL only to SUE.

(29) is a case of **multiple focus** in which in one and the same sentence, one expression introduces alternatives that are exploited in one way, and another expression introduces alternatives that are exploited in a different way. (29) can be paraphrased as: The only x such that Bill introduced x to Sue and noone else is $x = \text{Bill}$. The first *only* scopes over the second, and this is reflected by focus marking: Accent on *Bill* is stronger than accent on *Sue*, in contrast to the complex focus case of (28), where both accents are felt to be equally strong.

Another distinction relating to types of alternatives concerns the issue of the size of the alternative set. Sometimes this set is limited to a few items, perhaps down to the minimal number of two, the item in focus and one alternative. This is often the case in corrections or contrasts, in polarity questions that expect a positive or a negative answer, or in answers to alternative questions or restricted constituent questions such as the following:

- (30) A: What do you want to drink, tea or coffee?
 B: I want [TEA]_F.

At other times the alternative set is unrestricted, satisfying just the general condition that all the alternatives must be compatible with the focus in their semantic type. It is tempting to call focus with a limited set of alternatives **contrastive** (as suggested by Chafe 1976), but (30.B) doesn't seem to be more contrastive than an answer to the non-restricted question *What do you want to drink?* I would rather suggest to distinguish between closed alternatives and open alternatives, and talk about **closed vs. open focus**, when necessary.

The notion of **contrastive** focus I would like to restrict to focus used for truly contrastive purposes, which presupposes that the CG content contains a proposition with which the current utterance can be constructed, or that such a proposition can be accommodated (cf. Jacobs 1988). In (30), it is CG management, not CG content, that contains such a proposition. The typical use of

contrastive focus is corrective, but it can also be additive, as in A: *John wants coffee*. B: *MARy wants coffee, TOO*. There is evidence for particular marking strategies for contrastive focus, like the use of particular syntactic positions or of special prosodic patterns, see e.g. Selkirk (2002), Molnár (2002), Gussenhoven (2004).

Another type of focus that refers to the specific way of how the contribution by the alternatives is interpreted is **exhaustive** focus. It indicates that the focus denotation is the only one that leads to a true proposition, or rather more general: that the focus denotation is the logically strongest that does so. É. Kiss (1998) has pointed out that focus movement in Hungarian triggers this specific meaning, and it appears that cleft constructions in English trigger it as well:

(31) It's [JOHN and BILL]_F that stole a cookie.

This example says that nobody else stole a cookie but John and Bill. Consequently, exhaustive focus is not compatible with additive particles, like *too*. I do not see a good reason to introduce, in addition to exhaustive focus, the notion of identification focus that expresses an identity statement, as in 'The ones who stole a cookie are John and Bill'

As a final focus type I would like to mention **scalar focus**, also called **emphatic focus**. In it, the alternatives are ordered, and the focus denotation often is the least or greatest element. Scalar particles like *even* or *at least* require scalar focus, as well as strong polarity items such as in [*Wild HORses*]_F *wouldn't drag me there*.

3.8 Representation Formats for Focus

There are a number of ways in which the alternatives introduced by focus can be represented within a formal framework of semantic interpretation. These repre-

sentations are not independent of the possible interpretations of focus, and hence should be discussed here.

Alternative Semantics (Rooth 1985, 1992) assumes two levels of interpretations, the ordinary level and the level of alternatives. They are construed in parallel, and operators that exploit focus refer to both the ordinary meaning and the alternatives. The construction mechanism is particularly simple and incorporates the idea of focus introducing alternatives in a natural way, in the sense that it could not even represent anything else besides alternatives. It also predicts that focus-sensitive operators have to be in a position in which they can scope over their focus.⁶ However, Alternative Semantics has only limited means to express that two foci belong together, as in the case of complex focus, and it is insufficient in certain cases of multiple focus (cf. von Stechow 1990, Kratzer 1994, Krifka 2001). The reason is that in Alternative Semantics the focus denotations are not directly accessible to focus-sensitive operators; the operators only can see the effects that focus alternatives had on the meanings of expressions. The set of alternatives of the following example with a complex focus is a set of propositions:

- (32) [John introduced BILL_F to SUE_F]
 Meaning: INTRODUCED(BILL)(SUE)(JOHN)
 Alternatives: {INTRODUCED(x)(y)(JOHN) | x,y ∈ D}
 = {INTRODUCED(BILL)(SUE)(JOHN),
 INTRODUCED(BILL)(MARY)(JOHN),
 INTRODUCED(JIM)(SUE)(JOHN),
 INTRODUCED(JIM)(MARY)(JOHN), ...}

The Structured Meaning approach to focus (von Stechow 1990, Krifka 1992) assumes that focusing leads to a partition of meanings into a focus part

⁶ This does not necessarily hold for the version of Rooth (1992), where focus is mediated via anaphoric relations.

and a **background** part that, when applied to the focus denotation, yields the ordinary interpretation. Example (32) would get the following representation, where background and focus are represented by a pair, $\langle B, F \rangle$.

(33) $\langle \lambda \langle x, y \rangle [\text{INTRODUCED}(x)(y)(\text{JOHN})], \langle \text{BILL}, \text{SUE} \rangle \rangle$

The notion of background corresponds to the one of **presupposition skeleton** of Jackendoff (1972); notice that there is no corresponding notion within Alternative Semantics. The structuring can be triggered by syntactic movement of the focus item, as overtly done in focus movement, or by some equivalent operation. The Structured Meaning representation can express multiple focus and complex focus, but the representation format is not particularly tied to the notion of alternatives. It has to be stipulated that focus-sensitive operators are only allowed to express operations that relate a focus denotation to its alternatives (cf. Rooth 1995, who discusses this problem with a hypothetical verbal predicate, *tolfed*).

There is another framework of focus representation, In-Situ Binding Semantics, as developed in Wold (1996), whose representational complexity lies in between Alternative Semantics and Structured Meanings. It does not allow direct access to the focus denotation, but has a notion of background that allows to refer to the position in which foci are interpreted, and hence is able to express dependencies between foci.

It might well be that we need more than one representation formats to cover different aspects of focus. In particular, we might argue that focus marked by overt movement into a cleft position or dedicated focus position should be captured by Structured Meanings as this mimicks the syntactic structures involved there and predicts certain syntactic island restrictions. It is an open debate whether cases of in-situ focus should to be modelled by covert movement on LF, as the Structured Meaning approach would have. On the one hand, it was

pointed out early on that syntactic island restrictions in association with focus phenomena appear to be lacking (cf. Jackendoff 1972); on the other hand, it has been argued that they are in fact present (Drubig 1994). The discussion revolves around examples of the following kind:

- (34) John didn't introduced Bill to [the woman he met at SUE's party]
(but *MARY's / the woman he met at MARY's party).

It appears that the negation associates with focus on *Sue*, violating island restrictions. But then the *but*-phrase has to take up the whole constituent, not just the focus. This has been taken as evidence that negation associates with the whole bracketed NP, not with *Sue*. We can distinguish between a **focus phrase** (here, *the woman he met at SUE's_F party*) that contains a focus, which in turn determines the alternatives to the focus phrase. In the majority of cases, focus and focus phrase coincide, but not always, as (34) illustrates. As the focus can be deeply embedded within the focus phrase, this suggests a hybrid representation of focus: The relation between focus and focus phrase is mediated by the mechanisms of Alternative Semantics, and the relation between focus phrase and focus-sensitive operator is mediated by Structured Meanings (cf. Krifka 2006).

4 Givenness

4.1 What is Givenness?

We now turn to the second important category of IS, the indication that the denotation of an expression is present in the immediate CG content. Givenness was prominently treated by Chafe (1976), and there is ample evidence that human languages have devices with which speakers can make addressees aware that something that is present in the immediate linguistic context is taken up again.

A definition of Givenness must be such that it allows to say that an expression is given to a particular degree, e.g. whether it is maximally salient in the immediate CG or just given there, or whether it is given in the general CG or not given at all. The following attempt at a general definition takes care of that.

- (35) **A feature X of an expression α is a Givenness feature iff X indicates whether the denotation of α is present in the CG or not, and/or indicates the degree to which it is present in the immediate CG.**

With Focus we distinguished between expression focus and denotation focus. We do not have to make this distinction here, as Givenness always refers to denotations, never to expressions. There are two groups of phenomena that refer to Givenness, namely specific anaphoric expressions that have givenness features as part of their lexical specification, and other grammatical devices such as deaccentuation, ordering and deletion that can mark arbitrary constituents as given. I will deal with them in turn.

4.2 Anaphoric Expressions

These are specific linguistic forms that indicate the givenness status of their denotations, including personal pronouns, clitics and person inflection, demonstratives, definite articles, but also indefinite articles that indicate that their referent is not given. Definite articles can be used to indicate whether a denotation is given in a CG in general, whereas clitics and pronouns typically indicate that their denotations are given in the immediate CG.

There is a large literature on anaphoric devices, which I cannot even start to do justice here. But I want to point out that speakers typically have a hierarchy of distinct linguistic means at their disposal (as zero forms, clitics, pronouns, demonstratives...), and that denotations in the immediate CG are ranked with respect to their givenness status such that simpler anaphoric expres-

sions are used to refer to more salient denotations (cf. Prince 1981, Gundel e.a. 1993). This insight has been implemented within Centering Theory, which has developed formal means to model the dynamic change of the saliency of discourse referents in communication (cf. papers in Walker e.a. 1998).

4.3 Deaccentuation, Deletion and Word Order

There are three other ways to indicate Givenness: Deaccentuation, the reduction of the prosodic realization of expressions that are given in the immediate context; deletion, which can be seen as an extreme form of reduction; and the realization of an expression in a non-canonical position, typically before the canonical position. This is illustrated in the following examples:

- (36) a. Ten years after John inherited an old farm, he SOLD [the shed]_{Given}.
 b. Bill went to Greenland, and Mary did _ too.
 c. Bill showed the boy a girl.
 *Bill showed a boy the girl.
 Bill showed the girl to a boy.

In the first example, which corresponds to examples used by Umbach (2003), *the shed* is deaccented, and has to be understood as referring to the farm mentioned before. If it were not deaccented, it would mean to something different, like the shed that came with the farm. Example (b) illustrates VP ellipsis, which refers back to a VP meaning. The examples (c) show that in the double object construction, given constituents precede constituents that are new. This is a rule with high functional load in so-called free word order languages, an insight that goes back to Weil (1844).

As focus constituents typically are not given, and are realized with greater prosodic prominence, it has been proposed that focus is a complementary notion to givenness that can ultimately be eliminated from theoretical terminology (cf. Daneš 1970, Sgall e.a. 1986). But given constituents can be in focus, and then

bear accent. For example, it is possible to focus on pronouns, as in *Mary only saw HIM_F*. Schwarzschild (1999) develops a more refined theory of interaction of givenness and focusation, which checks givenness recursively and states that constituents not in focus must be given, and that focus has to be applied only when necessary, that is, to prevent that a constituent is given. But while focus is restricted in Schwarzschild's theory, it cannot be eliminated totally.

We have to assume both focus, the indication of alternatives, which is expressed by accentuation, and rules of marking given constituents, e.g. by deaccentuation. As the case of accented pronouns shows, focus accentuation overrides deaccentuation of given constituents, in the sense that focus has to be expressed by accent. However, if a larger constituent is focused, then givenness can influence the accent rules: The constituent that normally would bear accent can be deaccented, and accent can be realized on some other constituent within the focus expression (cf. Féry & Samek-Lodovici 2006). For example, while in VP focus the accent is normally realized on the argument, it is realized on the head when the argument is given:

- (37) A: I know that John stole a cookie. What did he do then?
B: He [reTURNed [the cookie]_{Given}]_F

This suggests an explanation why accent is normally realized on the argument in cases of wide focus. It is the arguments, not the heads, that are referential, and therefore the need to express whether they refer to something given is more pressing. If the normal accentuation rules state that accent is realized on the argument, then givenness of arguments can be expressed by deaccenting the argument and accenting the head instead.

5 Topics

5.1 What is Topic?

The terms “topic” and “comment” are used most frequently to refer to what has been introduced into linguistic thinking as “psychological subject” and “psychological predicate” by von der Gabelentz (1869), who used the first one to refer to the object which the speaker is thinking about, and the second to what the speaker is thinking about it. In terms related more closely to communication, topic is the entity that a speaker identifies about which then information, the comment, is given. This presupposes that information in human communication and memory is organized in a way that it can be said to be “about” something. This does not follow from a general definition of information. For example, relational databases or sets of possible worlds, both models for information, do not presuppose any relation of aboutness.

Reinhart (1982) has integrated this notion of topic into a theory of communication that makes use of the notion of CG. According to her, new information is not just added to the CG content in form of unstructured propositions, but is rather associated with entities, just like information in a file card system is associated with file cards that bear a particular heading. For example, while (38.a,b) express the same proposition, they structure it differently insofar as (a) should be stored as information about Aristotle Onassis, whereas (b) should be stored as information about Jacqueline Kennedy.

- (38) a. [Aristotle Onassis]_{Topic} [married Jacqueline Kennedy]_{Comment}.
 b. [Jacqueline Kennedy]_{Topic} [married Aristotle Onassis]_{Comment}.

This leads to the following definition, which presupposes a file-card like structure of information storage.

- (39) **The topic constituent identifies the entity or set of entities under which the information expressed in the comment constituent should be stored in the CG content.**

Just as with the notion of “focus”, the notion of “topic” has not been used in a terminologically clean way. Chafe (1976) called what is defined in (39) “subject”, a term that should be reserved for grammatical subjects to avoid confusion. Vallduví (1992) and Vallduví & Engdahl (1996) have used the term “link”. In the Prague School, the notion is called “theme”, and conflated with the one of old information (e.g., Daneš 1970). We should refrain from this, even if in many cases, topic constituents are “old” in the sense of being inferrable from the context. But there are certainly cases of new topics. The following sentence introduces a new entity into discourse and, at the same time, uses it as the denotation of a topic constituent, which amounts to introducing a new file card in the CG content.

- (40) [A good friend of mine]_{Topic} [married Britney Spears last year]_{Comment}.

The notions of Topic/Comment are sometimes mixed up with the notions of Background/Focus. However, as we will see in section 5.2, there are topics that contain a focus. And the Comment need not be identical to the focus either:

- (41) A: When did [Aristotle Onassis]_{Topic} marry Jacqueline Kennedy?
B: [He]_{Topic} [married her [in 1968]_{Focus}]_{Comment}

The definition in (39) includes the option that a comment is made about a set of entities. This takes care of the typical way how quantified sentences are interpreted, in which two sets are related by a quantifier that can be realized as a determiner or as an adverbial:

- (42) a. Every zebra in the zoo was sick.
 b. Most zebras in the zoo were sick.
- (43) Zebras in the zoo usually are sick.

The quantifier in such sentences express the extent to which the comment holds for the elements of the set. Assuming that sentences like (42), (43) are about zebras explains why natural language quantifiers are conservative, that is, why the truth value of sentences that contain a quantifier can be checked by looking solely at the restrictor set (here the set of zebras). It is important to note that the restrictor of quantifiers is not always topical, but in the majority of cases it is, and the property of conservativity that is motivated in those cases is transferred to cases in which quantifiers are not topical.

Sentences typically have only one topic, which can be explained within Reinhart's file-card metaphor: The simplest way to add information is to add it on one file card. But sentences with two or more topics are possible under certain circumstances in case a relation between two file cards is expressed, as in *As for Jack and Jill, they married last year*. A possible way to handle such cases is to introduce a new file card that contains information concerning both Jack and Jill. On the other hand, sentences may have no topic constituent at all, under which condition they are called **thetic**, following Marty (1884). But as already Marty had indicated, this does not mean that such sentences are about nothing. While they lack a topic constituent, they do have a topic denotation, typically a situation that is given in the context, as in [*The HOUSE is on fire*]_{Comment}.

In addition to the notion topic/comment, some theories also assume a structuring into subject and predicate, or predication basis and predicate, cf. Sasse (1987), Jacobs (2001) and Kuroda (2005). I will not go into this distinction here in greater detail, but I doubt that it is a distinction that is to be explained as one of IS.

But then the question is whether topic and comment should be considered terms relating to IS to begin with. Without question, topic/comment structure is a packaging phenomenon; (38.a) and (b) package the same information differently, so that it is entered on the file card for Aristoteles Onassis and for Jacqueline Kennedy, respectively. But section 2.1 stressed that the packaging must respond to the temporary (recent) common ground, and this restriction certainly is not always satisfied. Assume that two speakers A, B meet who both know John well, and A says to B: *Did you know? John has married last week.* This is an assertion about John; the information will be entered in the file card for John in the CG content of A and B. But this does not necessarily relate to the recent state of the CG content, it can also respond to the long-term state, e.g. a long established and known interest of B in John.

Yet we find that topic choice often does respond to properties of the temporary information state. There is a well-documented tendency to keep the topic constant over longer stretches of discourse (so-called **topic chains**, cf. Givón 1983). Hence, while the notions of topic and comment fail to be IS terms in the sense that they always relate to the temporary state of the CG, they quite often do relate to it, as the topic denotation in the preceding utterance is the first choice for the topic denotation of the current utterance.

5.2 Contrastive Topics

Contrastive topics are topics with a rising accent, as in B's answer in (44). They arguably do not constitute an information-packaging category in their own right, but represent a combination of topic and focus, as indicated in the example, in the following sense: They consist of an aboutness topic that contains a focus, which is doing what focus always does, namely indicating an alternative. In this case, it indicates alternative aboutness topics.

- (44) A: What do your siblings do?
 B: [My [Sister]_{Focus}]_{Topic} [studies MEDicine]_{Focus},
 and [my [BROther]_{Focus}]_{Topic} is [working on a FREIGHT ship]_{Focus}.

In the first clause of B's response, focus on *sister* indicates an alternative to the topic 'my sister', namely, 'my brother'. The typical reason why the presence of an alternative is highlighted is to indicate that the current clause does not deliver all the information that is expected. This is why we often find contrastive topics to indicate a strategy of incremental answering in the CG management, as in our example in which an issue is split into subissues. This has been assumed to be the function of contrastive topics in Roberts (1996) and Büring (1997, 2003). It is pointed out in this literature that there are accommodation phenomena that affect what we call CG management. In the following case, contrastive topic accommodates a more general question, *Who was where?*

- (45) A: Where were you (at the time of the murder)?
 B: [[I]_{Focus}]_{Topic} [was [at HOME]_{Focus}]_{Comment}

However, it should be noted that we find contrastive topics also in cases in which the idea of a questioning strategy is not easily applicable. In example (46) the answer given does not satisfy the expectations expressed in the question, in combination with a rising intonation in the comment that indicates that the assertion, while the best one to be made, may not satisfy all needs.

- (46) A: Does your sister speak Portuguese?
 B: [My [BROther]_{Focus}]_{Topic} [[DOES]_{Focus}]_{Comment}

It should be noted that focus within a topic is interpreted as usual: indicating the presence of alternatives, in this case, alternative topics. Focus is marked

by (rising) accent, but it is not the main accent of the sentence, which is on a constituent of the comment.

6 Frame Setting and Delimitation

6.1 What is Frame Setting?

Frame setting, according to Jacobs (2001), is often not separated clearly from aboutness topic, and Chafe (1976), who stresses their difference, uses the term “topic” for precisely this function. What is it? Statements like (47) certainly should not be entered under a file card about the health situation, and the topic of (48) is Daimler-Chrysler, not Germany or America.

- (47) A: How is John?
 B: {Healthwise / As for his health}, he is [FINE]_F.
- (48) A: How is business going for Daimler-Chrysler?
 B: [In GERmany]_{Frame} the prospects are [GOOD]_F,
 but [in AMERica]_{Frame} they are [loosing MONEy]_F.

It is often said that adverbials like *healthwise* or *in Germany* are **frame setters** that set the frame in which the following expression should be interpreted; Chafe says that it is used “to limit the applicability of the main predication to a certain restricted domain”. It is still unclear how this should be understood more precisely. For cases like (47) which contain an evaluative predicate (*fine*) that is unspecified with respect to the dimension of evaluation (financially, healthwise, spiritually etc.), this can be made precise by assuming that it is the task of the frame-setting adverbial to specify that dimension. Similarly, (48) has a situation dimension that is specified by the frame setter. But we also have statements like *As for his health situation, he had a bypass operation recently*, which cannot be explained in this way. It appears that frame setters indicate the general

type of information that can be given about an individual. A possible implementation of this idea is that they systematically restrict the language (the notions that can be expressed) in certain ways: notions like *he won a lot of money* cannot be interpreted in the scope of *healthwise*, and notions like *he is doing fine* have to be restricted to the indicated dimension.

In any case, in exchanges like (47) *alternative* frames play a role, and hence we can assume that explicit frame setters always are focused in the sense of section 3.1. They choose one out of a set of frames and state that the proposition holds within this frame. If there is no alternative perspective to be considered, then there is no need for an explicit frame setter either. As explicit frame setters always indicate alternatives, they clearly belong to IS. More specifically, they relate to CD management, as they imply that there are other aspects for which other predications might hold. In this they are similar to contrastive topics (section 5.2), as they too split up a complex issue into subissues.

6.2 Delimitation

The similarity between contrastive topics and frame setters mentioned above is worth to be looked at more closely. What contrastive topics and frame setters have in common is that they express that, for the communicative needs at the current point of discourse, the current contribution only gives a limited or incomplete answer. With contrastive topics, the current CG management contains the expectation that information about a more comprehensive, or distinct, entity is given; contrastive topic indicates that the topic of the sentence diverges from this expectation. With frame setters, the current CG management contains the expectation that information of a different, e.g. more comprehensive, type is given, and the frame setter indicates that the information actually provided is restricted to the particular dimension specified. This more general view is

suggested in Büring's notion of contrastive topics, which do not have to be topics in the sense of aboutness topics.

Büring develops a formal model of this notion within the representation framework of Alternative Semantics: Contrastive topic induces a set of alternatives over and above the set of alternatives that are introduced by the focus within the predication, ending up with sets of sets of alternatives.

- (49) A: Which subjects do your siblings study?
 B: [My SISTER]_{Contrastive Topic} [Comment studies [PoMOlogy]_{Focus}]]
 = { {x STUDIES y | y ∈ {POMOLOGY, OLERICULTURE, ...}
 | x ∈ {SISTER, BROTHER, ...} }
 = { {SISTER STUDIES POMOLOGY, SISTER STUDIES OLERICULTURE, ...},
 {BROTHER STUDIES POMOLOGY, BROTHER STUDIES OLERICULTURE, ...} }

This incorporates the important observation that contrastive topics always occur in expressions that have another focus outside of the contrastive topic, a rule that holds for frame setters as well. But one should distinguish the formal implementation of delimitation from its communicative purpose. The following is an attempt to characterize this in a most general way:

- (50) **A Delimitator α in an expression [... α ... β _{Focus}...] always comes with a focus *within* α that generates alternatives α' . It indicates that the current informational needs of the CG are not wholly satisfied by [... α ... β _{Focus}...], but would satisfy it by additional expressions of the general form [... α' ... β' _{Focus}...].**

In this definition no reference to (aboutness) topic or frame setting is made. This allows for cases like (51) that do not plausibly belong to either category:

- (51) [an [inGENious] mathematician]_{Delim} he is [NOT]_{Focus}.

The sentence suggests alternative statements like *he is a mediocre mathematician* hold. The definition (50) is also neutral as to the speech act type of the expression, which explains why delimitations occur in questions and commands as in (52):

(52) And when did you read [DostoYEVsky]_{Delimit} in school?

Delimitation indicates that the current question does not express the full communicative needs as there are other questions at issue, such as *When did you read Shakespeare in school?*

If delimitations do what they are suggested to do here, then this explains why they often help to indicate a certain questioning strategy. If it is explicitly marked that an expression is suboptimal as far as the communicative needs of the moment are concerned, then one important reason for this is that the current communicative move only responds to a local need, and not yet to the global need of the CG. By this they help to structure CG management by distinguishing between local and more global communicative goals.

7 Cohesion and Rhetorical Structure

The notion of a structured set of questions under discussion has been developed by a variety of researchers, such as Klein & von Stutterheim (1987), van Kuppevelt (1994), Roberts (1996) and Buring (2003) leads to a richer understanding of CG management. We have seen that delimiters can create and respond to such structures.

I would like to point out that beyond the idea of question stacks and question trees, linguistic communication is built on a rich structure of discourse relations, as investigated in a number of theories such as in the study of cohesion in Hassan & Halliday (1976), and in Rhetorical Structure Theory (Mann &

Thompson 1988). Structured Discourse Representation Theory, as developed in Asher & Lascarides (2004), shows that there is an interaction between discourse structure and possible anaphoric relations. CG management cannot be described without referring to the strategies how events are narrated or arguments are being made. For example, there are strategies that first lay out the premises and then lead to a conclusion, and there are others that start with the conclusion and then motivate it or elaborate on it. This will result in locally distinct structures of the CG, and each individual sentence will respond to it. In this sense, the devices studied in these theories, like discourse particles and intonational meaning, squarely belong to Information Structure as envisioned by Chafe.

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Notions of Focus Anaphoricity

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This article reviews some of the theoretical notions and empirical phenomena which figure in current formal-semantic theories of focus. It also develops the connection between “alternative semantics” and “givenness” accounts of focus interpretation.

Keywords: focus, intonation, breadth of focus, scope of focus, focus anaphoricity

1 Introduction

The contemporary theoretical term *focus* originates in Halliday (1967), who said that the capitalized phrases in sentences (1)-(4) have a grammatical property which he called *information focus*.

- (1) (Who painted the shed yesterday?)
JOHN painted the shed yesterday.
- (2) (When did John paint the shed?)
John painted the shed YESTERDAY.
- (3) Mary always goes to TOWN on Saturdays.
- (4) Mary always goes to town on SATURDAYS.

In cases such as (1)—(2), the location of focus is conditioned by how the sentence containing the focus fits into its context, here the question. The examples illustrate that if the questioned element is changed, the locus of focus changes in parallel. Strikingly, in other cases focus has a truth-conditional semantic effect. If last year, Mary went to town on a Wednesday half a dozen times, then (4) is false (as a generalization about this time period) but (3) may

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be true. If on half a dozen Saturdays she took a walk in the woods and avoided town, then (3) is false, but (4) may still be true.

2 Grammatical representation of focus

Focus is a grammatical property which has a phonology (some kind of prominence) and a semantics and/or pragmatics (a topic which will be discussed later). In this respect, it is like content words or features such as tense, which also have an influence on both sides of the form/meaning correspondence. To link the two, it is usually assumed that focus is represented syntactically, by means of a syntactic feature or other piece of syntactic representation. This move was made by Jackendoff (1972), who introduced a syntactic feature which is written F. The F feature marks the focused phrase, and a phrase which is not marked with F is unfocused. Thus the focus feature is simply a binary-valued syntactic feature. (5) and (6) correspond to (1) and (2).

(5) $[_S [_{NP} \text{John}]_F [_{VP} [_{VP} \text{painted} [_{NP} \text{the shed}]]] [_{NP} \text{yesterday}]]]$

(6) $[_S [_{NP} \text{John}] [_{VP} [_{VP} \text{painted} [_{NP} \text{the shed}]]] [_{NP} \text{yesterday}]_F]]]$

The point of the F feature is to link up the phonology of focus with the semantics and pragmatics of focus. This is done with independent phonological and semantic principles which refer to the F feature. (7) is the phonological principle from Jackendoff (1972). It says that F corresponds to stress prominence in a certain domain. Jackendoff's semantic principle was (8). It generates a semantic object which has variables in the position of focus phrases. The Presupposition corresponding to (5) is an open proposition '*y* painted the shed yesterday', with a variable *y* in the position of the focused phrase.

(7) If a phrase P is chosen as the focus of a sentence S, the highest stress in S will be on the syllable of P that is assigned highest stress by the regular stress rules.

- (8) The semantic material associated with surface structure nodes dominated by F is the Focus of the sentence. To derive the Presupposition, substitute appropriate semantic variables for the focused material.

To avoid confusion with the standard notion of presupposition in natural language semantics, it is better to substitute another technical term for Jackendoff's Presupposition. Let's call this semantic object which has variables substituted for focused phrases the *focus skeleton*. As we will see, the focus skeleton is closely related to the constructs hypothesized in current semantic accounts of focus. A rough idea is that the focus skeleton functions as a schema which is matched to the discourse context, and which is referred to in the semantics of certain constructions.

3 Breadth of focus

The F feature resolves representationally the question of what phrase or phrases are focused. In a given syntactic tree, the focused phrases are the phrases which bear the F feature. A focus on a relatively small phrase, such as a phrase with a single word as a terminal string, is said to be a "narrow" focus. (9) gives examples of narrow focus in a question context.

- (9) a. (What did Mary's do to Fluffy?)
She fed_F Fluffy.
b. (What cats did Mary feed?)
She fed Fluffy_F.

A focus on a relatively large phrase such as verb phrase containing several words is said to be a *broad* focus or *wide* focus. The terminology is natural, because the interval of words *fed Fluffy* is broader (or wider) than the interval of words *fed* and the interval of words *Fluffy*. (10) illustrates broad focus on VP in a question context.

(10) (What did Mary do when she got home?)

She [fed Fluffy]_F.

In both (9b) and in (10) the principal prominence falls on the first syllable of *Fluffy*, as is predicted by the phonological constraint (7). Jackendoff (1972) put forth the hypothesis that fixing a phonological representation which has sentence stress on the first syllable of *Fluffy* in *she fed Fluffy*, syntactic F-marking could be either on the object [Fluffy], the VP [fed Fluffy], or indeed the entire sentence [she fed Fluffy]. So on this hypothesis, the breadth of focus is often ambiguous, if one pays attention only to a phonological representation.

However, breadth of focus can be constrained by phonological phrasing. In the narrow-focus example (11), it seems the major intonational break can follow either the subject *Magdalena*, or the verb *fed*.

(11) (Which cats did your sister Magdalena feed?)

MagdaLEna // fed FLUFFy .

MagdaLEna fed // FLUFFy .

If we switch focus to the VP as in (12), it seems that the pronunciation with the major phrase break after *fed* is impossible.

(12) (What did your sister Magdalena do when she got home?)

?? MagdaLEna fed // FLUFFy .

MagdaLEna // fed FLUFFy .

Selkirk (1984) introduced the hypothesis that F marking in examples like (10) is nested. Both verb *fed* and the nominal *Fluffy* are novel in the discourse, the reasoning goes, and so they are marked with F's. The correct representation for (10) on this account is (13).

(13) (What did Mary do when she got home?)

She [fed_F Fluffy_F]_F.

4 Scope of focus

The phonological constraint (7) refers not just to a focus, but to the notion of a phrase being the focus of a sentence. Assuming that there is a focus on *John* in example (14), is *John* the focus of the embedded sentence [John was at the party], or of the containing sentence [that John was at the party is certain]? Just locating an F feature on *John* as in (15) does not resolve the question.

(14) Who was at the party?

That JOHN was at the party // is CERTAIN.

(15) That John_F was at the party is certain.

On both phonological grounds, one can argue that the sentence S referred to in the constraint (7) must be the embedded sentence in this case. While *John* is more prominent than anything else in the embedded sentence, it is probably not more prominent than *certain*. Truckenbrodt (1995) discussed data like (16) where according to an analysis of Rooth (1992), there are F-features on *American* and *Canadian*. Truckenbrodt pointed out that while *American* is more prominent than *farmer*, arguably the most prominent syllable in the sentence as whole is *joke*. So if we want to maintain the constraint (7), we can not say that *American* is the focus of the whole sentence in (15), because that would require that *American* has highest stress prominence in the whole sentence. Note that in this case, there is no embedded sentence, so there is no choice of a sentence for which the constraint (7) is observed. Truckenbrodt called the stretch of phonological material within which a focus is maximally prominent the *domain* of the focus, and suggested that the domain of the focus on *American* is *an American farmer* or *American farmer*.

(16) An American_F farmer told a Canadian_F farmer a joke.

There is also a semantic side to this argument. (17a) is the focus skeleton obtained from the embedded sentence in (15). It can be matched to the question context by matching the variable y to the position of the wh-phrase. (We will see later how this matching process can be formalized.) On the other hand, (17b) is focus skeleton obtained using the matrix sentence. This does not match to the question context. So also on semantic grounds, there is reason to think that *John* is the focus of the embedded sentence.

(17)a. Focus skeleton for embedded sentence in (14)

‘ y was at the party’

b. Focus skeleton for matrix sentence in (14)

‘that y was at the party is certain’

The dimension of variation which is illustrated in (17) is called the *scope* of focus. In (15), the scope of the focus on *American* is the containing nominal [American farmer] or [an American farmer], not the whole sentence. And in (14) the scope of the focus on *John* is the embedded sentence, not the matrix.

While the notion of scope is in fact implicit in both the phonological constraint (7) and the semantic constraint (8), a syntactic representation of scope does not follow immediately from postulating an F feature. Rooth (1992) proposed that the scope of an F is fixed by a “focus interpretation” operator $\sim k$, which also specifies an antecedent k for the focus skeleton. Chomsky (1970) suggested that the scope of focus is marked representationally by covert movement.

Schwartzschild (1999) made a more parsimonious proposal: in trees with nested configurations of F marking, one F delimits the scope of another. A representation for (15) where the scope of the focus on *John* is the embedded clause is (18). Effectively, the maximal scope of an F on a node α is the maximal phrase β which dominates α and is not F-marked. Since in (18) the embedded *that*-clause is F-marked but the embedded S is not, the scope is the embedded

S.

(18) [[that [John_F was at the party]]_F[is_F certain_F]_F]

5 Focus anaphoricity

Focus anaphoricity is the hypothesis that the semantics and pragmatics of focus involves a relation to context which is a kind of anaphora. Suppose we put (18) back into its context, and add an index which indicates that the “antecedent” for the focus on *John* is the question. Then we arrive at something along the lines of (19), which gives one option using the representation where the scope of F is delimited by F, and another option where the scope is delimited by \sim .

(19) [Who was at the party]₆
 [[that [John_{F6} was at the party]]_F[is_Fcertain_F]_F]
 [[that [John_F was at the party]~ 6] [is certain]]

The rough idea is that the focus (or the focus interpretation operator) is allowed to coindexed with the question (and thus licensed by it) because the focus skeleton (17a) matches the question. A couple of descriptive classes of matching can be identified. Sometimes the antecedent looks like the scope of the focus, but with something else of the same type substituted for the focused phrase. (20) is an example, where *John* in the antecedent substitutes for the F-marked *Mary*. Call this substitution focus.

(20) [John wrote the report]₄.
 [No, [Mary_{F4} wrote it]]_F.

Rooth (1992) analyzed configurations where the antecedent is a set of propositions. This includes the question configuration as in (19), on the hypothesis that the semantic value of a question is a set of propositions. In some cases the set of propositions is implicit in a discourse representation. The pragmatic

logic of the scalar quantity implicature example (21) refers to a set of alternative assertions, such as the assertion that Paul passed and the assertion that Steve passed, where Steve and Paul are two of the speaker's co-students. The index 2 can be taken to be the referential index of this set of propositions.

(21) How did the exam go?

[Well [I_{F2} passed]]_F

An F whose antecedent is a set of propositions is called an alternative-set focus. Another class of antecedents have an existentially quantified phrase replacing the focus in the antecedent. (22) is an example.

(22) [Mary spoke to someone about his problems]_g

[Yea, [she spoke to John_{F8} about his problems]]_F.

6 Focus interpretation

Formal-semantic developments of focus anaphoricity state conditions on what can be an antecedent for a focus. For instance, we want to rule out the representation (23), which has an inappropriate correspondence between question and answer.

(23) [who painted the shed yesterday]₂

[John painted the shed [yesterday]_{F2}]

Rooth (1992) stated a constraint covering alternative-set focus which works as follows. One first generates a set X of propositions by making all possible substitutions for the variables in the focus skeleton. This object is called a focus semantic value. The constraint on the antecedent is that it has to be a subset of X with cardinality at least two. In the answer of (23), the focus skeleton has a variable in the position of *yesterday*, so the set X contains propositions like 'John painted the shed on Nov. 19th, 2006', 'John painted the shed on

Nov. 20th, 2006’, ‘John painted the shed in 2005’, and so forth, with various choices for the frame time adverb substituting for *yesterday*. The antecedent question, on a theory where questions denote sets of propositions, denotes a set Y containing propositions such as ‘John painted the shed on Nov. 20th, 2006’, ‘Mary painted the shed on Nov. 20th, 2006’, ‘Bill painted the shed on Nov. 20th, 2006’, assuming the yesterday determined by the time of utterance is Nov. 20th 2006. Since ‘Mary painted the shed on Nov. 20th, 2006’ is an element of Y but not of X , the constraint $Y \subseteq X$ is not satisfied, and the representation (23) is not licensed. This is what we want.

What about substitution focus? Rooth (1992) stated a second clause case which allows the antecedent to be an element of the focus semantic value rather than a subset of it. This is unattractive, because the definition is disjunctive. Schwarzschild (1999) solved this problem by giving a uniform constraint which covers alternative-set focus and substitution focus, and also covers existential antecedents as in (22). The new constraint checks entailment between a proposition a derived from the antecedent, and a proposition f derived from the focus skeleton. In f , focus variables are existentially quantified, and if the antecedent has propositional type, a is simply the proposition denoted by the antecedent. This already covers (22), because a is ‘Mary spoke to some person x about x ’s problems’, while f is ‘Mary spoke to some entity x about x ’s problems’. Since a entails f , the representation (22) is licensed.

In alternative-set focus, the antecedent denotes a set of propositions, or in a functional type system, a characteristic function of a set of propositions. The corresponding type label is $(st)t$, where st is the type label for propositions. Schwarzschild’s axiom concerning antecedents with functional types is that they are saturated to the type t by plugging in existentially quantified variables for the arguments. He uses Karttunen’s semantics for questions, where in a world w , a question denotes a set of propositions which are true in w (Karttunen 1977). Let’s look at (24), which is the indexed representation for (9b). In

a world w , the question denotes the characteristic function set of true propositions of the form $\text{feed}(\text{Magdalena}, y)$, where y is a cat in w . To existentially quantify the argument of this characteristic function is to require that there be some true proposition of the form $\text{feed}(\text{Magdalena}, y)$, i.e. that Magdalena fed some cat. Skipping some details related to the possible-worlds framework, the result is that a is the proposition $\exists y[\text{cat}(y) \wedge \text{feed}(\text{Magdalena}, y)]$. f is the proposition $\exists y[\text{feed}(\text{Magdalena}, y)]$, so a entails f .

(24) [what cats did Magdalena₃ feed]₄
 [she₃ [fed [Fluffy]_{F4}]]

We can conjecture that entailment semantics properly generalizes the representations licensed in alternative semantics, so that specific analyses which use alternative semantics can be ported to entailment semantics without changing the representation of the antecedents or the indexing relations. Some additional issues remain. Schwarzschild (1999) proposed that the entailment constraint is applied at any non-F-marked node, not just the maximal scope of focus as defined above. In (24) the entailment constraint would be applied at the VP level [fed Fluffy_F], as well as the S level. In such cases f is generated by existentially quantifying arguments. In this case this produces $\exists x \exists y[\text{feed}(x, y)]$, which is entailed by the same antecedent f . In this version of entailment semantics (which is the official version of Schwarzschild's givenness semantics), one should not speak of the unique scope of a focus, but of the possibly multiple levels where the entailment constraint is applied. These are simply the non-F-marked phrases.

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Topic and Focus: Two Structural Positions Associated with Logical Functions in the Left Periphery of the Hungarian Sentence

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The paper explicates the notions of topic, contrastive topic, and focus as used in the analysis of Hungarian. Based on distributional criteria, topic and focus are claimed to represent distinct structural positions in the left periphery of the Hungarian sentence, associated with logical rather than discourse functions. The topic is interpreted as the logical subject of predication. The focus is analyzed as a derived main predicate, specifying the referential content of the set denoted by the backgrounded post-focus section of the sentence. The exhaustivity associated with the focus, and the existential presupposition associated with the background are shown to be properties following from their specificational predication relation.

Keywords: topic, focus, contrastive topic, exhaustive identification

1 Introduction

My interpretation of the notions topic, contrastive topic, and focus reflects the usage of these terms in Hungarian generative grammar.¹ In Hungarian linguistics, these terms denote grammatical functions linked to invariant structural positions and associated with invariant logical-semantic roles.

¹ See Horvath 1976, É. Kiss 1977, Szabolcsi 1981, É. Kiss 1981, Szabolcsi 1983, Horvath 1986, Kenesei 1986, É. Kiss 1987, Kiefer & É. Kiss (eds.) 1994, Bródy 1990, 1995, É. Kiss 1998, 2002, Surányi 2002, Gyuris 2003, É. Kiss – Gyuris 2003, Maleczki 2004, Olsvay 2004, Horváth 2005, Bende-Farkas 2006, É. Kiss 2006 etc., and for partially different views, Szendrői (2003) and Wedgwood 2005.

2 The topic

An eventuality is usually described in Hungarian as a statement (a predicate) about one of its participants (the topic). The topic-predicate articulation is manifested on the syntactic, prosodic, and semantic levels alike:

- (1) The topic is an XP extracted from the functionally extended verb phrase into the left periphery of the sentence. It precedes the pitch accent that marks the left edge of the functionally extended verb phrase in Hungarian. It is interpreted as the logical subject of predication.

On the syntactic level, the topic is an argument preposed from the maximally extended verb phrase into clause-initial position, with a trace/copy in the vP. Sentence adverbials base-generated external to the maximal verbal projection are not topics. Referential locative and temporal adverbials, however, can be analyzed not only as sentence adverbials but also as optional arguments binding traces in the vP, hence they can function as topics in the left periphery.

The landing site of topics is the specifier of the functional projection TopP. In the case of multiple topicalization, the iteration of TopP is assumed. The relative order of topics and sentence adverbials is free.²

The topic functions as the logical subject; it presents the individual that the sentence predicates about. In a multiple topic construction, the topicalized arguments fulfil the role of the logical subject of predication together; it is their relation that is predicated about.

In accordance with its function, the logical subject must be a referring expression associated with an existential presupposition. Names, definite noun

² Frascarelli & Hinterhölz (2006) argue that the order of topics is not free but follows the following pattern: aboutness>contrastive>familiar. Frey (2005) claims that sentence adverbials must follow the topic in German. The observance of these constraints perhaps yields slightly preferred options in Hungarian; still every permutation of the various kinds of topics and sentence adverbials in the preverbal domain is grammatical in Hungarian.

phrases, and specific indefinite noun phrases (or PPs subsuming such a noun phrase) are all possible topics, irrespective of their subject, object, or prepositional object status. For example:

- (2) a. *Az egyik agresszív játékost ki- állították.*
 the one aggressive player-ACC out sent-they
 ‘One of the aggressive players was sent out.’
- b. *A csapat szállodája előtt fotóriporterek gyülekeztek.*
 the team’s hotel before cameramen-NOM gathered
 ‘In front of the team’s hotel, cameramen were gathering.’

Neither universal quantifiers, nor monotone decreasing quantifiers can be topicalized. (Nominals with a numeral modifier, or with the determiner *sok* ‘many’ or *legtöbb* ‘most’, on the other hand, can be forced into referential readings under which they are possible topics.) Noun phrases which are necessarily non-specific – either for syntactic reasons, having no determiner as in (4a), or for semantic reasons, being in an intensional context as in (4b) – are not fit for the logical subject role, either. (These constraints are lifted in the case of contrastive topics, to be discussed in section 3.) Cf.

- (3) a. * *Repedések nyilvánvalóan keletkeztek a földrengés után.*
 cracks obviously formed the earthquake after
 ‘Obviously cracks formed after the earthquake.’
- b. * *Egy amerikai milliomosra valószínűleg vár Mari.*
 an American millionaire-for probably waits Mary-NOM
 ‘Probably Mary waits for an American millionaire.’

The specificity requirement associated with the Hungarian topic only means that its referent must exist in the universe of discourse (or at least in the speaker’s universe) independently of the event described in the sentence; however, it need

not be uniquely identifiable. Thus *valaki* ‘somebody’, and *valami* ‘something’ are also topicalizable:

- (4) *Valaki* el- lopta a biciklimet!
 somebody PRT stole my bicycle
 ‘Somebody stole my bicycle!’

The topic of the Hungarian sentence need not be contextually given. All-new sentences can also have a topic. For example, a large part of the headlines in a newspaper display a topic – predicate articulation:

- (5) *Az európai baromfiállomány egyötöde* szalmonellával fertőzött.
 the European poultry’s one-fifth salmonella-with infected
 ‘One fifth of European poultry is infected with salmonella.’

At the same time, all-new sentences can also be topicless:

- (6) *Ki- zárja a szlovák kormánypártot az EP szocialista frakciója.*
 PRT excludes the Slovak governing-party-ACC the EP’s Socialist fraction
 ‘The socialist fraction of the EP excludes the Slovak governing party.’

3 Contrastive topic

If the topic is not only stressed but is also pronounced with a fall-rise denoting a contrast (marked by the symbol \checkmark), the referentiality requirement associated with it is apparently lifted. Thus non-specific indefinites and quantified noun phrases can also be contrastively topicalized.

- (7) a. \checkmark *Repedések* nem keletkeztek a földrengés után.
 cracks not formed the earthquake after
 ‘Cracks didn’t form after the earthquake.’

- b. $\sqrt{\text{Minden dolgozatot CSAK KÉT DIÁK írt meg határidőre.}}$
 every paper-ACC only two student wrote PRT deadline-by
 ‘All the papers were only written by two students by the deadline.’

A non-contrastive topic does not even have to be a noun phrase; it can also be a verbal particle (8a), a predicative adjective or nominal (8b), or even a verb (8c). V-topicalization involves copying instead of movement; the verb is represented in Spec,TopP by an (elliptic?) infinitive phrase, and both copies are pronounced.

- (8) a. $\sqrt{\text{Fel LIFTEN megyek, le GYALOG.}}$
 up elevator-by go-I down foot-on
 ‘Up I go by elevator, down I go on foot.’
- b. $\sqrt{\text{Biciklit SOKAN vásároltak.}}$
 bicycle-ACC many bought
 ‘Bicycle, many people bought.’
- c. $\sqrt{\text{Enni EVETT Péter egy keveset.}}$
 eat-INF ate Peter-NOM a little-ACC
 ‘As for eating, Peter ate a little.’

In É. Kiss – Gyuris (2003) we propose an analysis that assimilates contrastive topics to ordinary topics as defined in (1). The proposal is based on Szabolcsi’s (1983) idea that contrast is a means of individuation, i.e., non-individual-denoting expressions are understood as distinct semantic objects if they are contrasted. (Think of examples like *TRABANTTAL jöttem, nem AUTÓVAL* ‘BY TRABANT I came, not BY CAR’ - expressing that the speaker considers the property ‘Trabant’ and the property ‘car’ not to be overlapping.) Non-individual-denoting expressions individuated by contrast denote properties which the rest of the sentence predicates a (higher-order) property about. A quantifier functioning as a contrastive topic denotes a property of plural individuals, and its apparent narrow scope arises from the fact that it is considered to be a predicate over a

variable inherent in the lexical representation of the verb. In (8b), for example, the subject of predication is the property 'bicycle', which is possibly embodied by different bicycles for each of the many persons in question.

4 Focus

The syntactic, semantic and prosodic properties of the focus of the Hungarian sentence are summarized in (9):

- (9) The focus is an immediately preverbal constituent, expressing exhaustive identification, bearing a pitch accent.

Syntactically, the Hungarian focus is an XP occupying an invariant A-bar position, identified by Brody (1990) as the specifier of a FocP. The finite V, which follows the verbal particle in neutral sentences (10a), is left-adjacent to the focus (10b), which may be due to V movement across the particle – into the head of a Non-NeutralP according to Olsvay (2004). FocP is subsumed by TopP.

- (10) a. [TP össze vezett János Marival]
 out fell John Mary-with
 ‘John fell out with Mary.’
- b. [TopP János [FocP MARIVAL [NNP vezett [TP össze t_V]]]]
 ‘It is stated about John that it was Mary that he fell out with.’

The functional projection harboring the focus constituent seems iterable, with the V moving up cyclically into a position adjacent to the highest focus:

- (11) [FocP CSAK JÁNOS [NNP olvasott [FocP CSAK EGY CIKKET [NNP t_V[TP el t_V]]]]]
 only John read only one paper-ACC PRT
 ‘Only John read only one paper.’

Certain types of elements, e.g. *wh*-phrases, phrases modified by *only*, or monoton decreasing quantifiers, are obligatorily focussed. Universal quantifiers, and phrases associated with *also* and *even* are barred from focus position.

Spec,FocP is filled by an argument or a predicative adverbial via movement constrained in the usual way. The focus binds a variable, and displays a version of the Weak Crossover effect. It also licences a parasitic gap:

- (12) KÉT VENDÉGET_i hívtam meg t_i anélkül, hogy ismernék *pg*,
 two guest-ACC invited-I PRT without-it that know-I
 ‘It was two guests that I invited without knowing.’

The Hungarian focus expresses exhaustive identification. Szabolcsi (1981) describes its meaning with the formula illustrated in (13b):

- (13) a. PETER aludt a padlón.
 Peter slept the floor-on
 ‘It was Peter who slept on the floor.’
 b. ‘for every x, x slept on the floor iff x = Péter’

The universal quantifier in (13b) is to be interpreted on a relevant set. Evidence of the [+exhaustive] feature of focus is provided by the fact that (13a) and (14a) cannot be simultaneously true, i.e., (13a) is not a consequence of (14a) but contradicts it. It is the negation of (13a) that can be coordinated with (14a):

- (14) a. PETER ÉS PÁL aludt a padlón.
 Peter and Paul slept the floor-on
 ‘It was Peter and Paul who slept on the floor.’
 b. Nem PÉTER aludt a padlón, hanem PÉTER ÉS PÁL (aludt a padlón).
 ‘It wasn’t Peter who slept on the floor but it was Peter and Paul.’

Example (15) does not refute the exhaustivity of focus; its focus provides a partially specified exhaustive list of the individuals for which the TP holds:

- (15) Többek között PÉTER aludt a padlón.
 among others Peter slept the floor-on
 ‘It was Peter, among others, who slept on the floor.’

Kenesei (1986) attributes the [+exhaustive] feature of focus to an iota operator, which performs identification – and thereby also exclusion – in a restricted domain. In É. Kiss (1998) I claimed that the preverbal focus represents the value of a focus operator operating on a set of alternatives for which the predicate can potentially hold, exhaustively identifying the subset for which the predicate actually holds. Horvath (2004) assumes an Exhaustive Identification Operator (EIOp) merged with the focus phrase. Bende-Farkas (2006) identifies this operator semantically as a maximality operator.

In my current view, influenced by Higgins (1973) and Huber (2000), the focus is a specificational predicate, representing the main assertion in the sentence. It is predicated of the background, the open sentence corresponding to the post-focus section of the clause. The focus specifies the referential content of the set denoted by this open sentence.

This analysis predicts not only the exhaustivity associated with focus, but also the existential presupposition associated with the background. Exhaustivity is entailed by the specificational predicate role of focus: the specification of the referential content of a set implies the exhaustive listing of its elements. The existential presupposition of the background follows from the fact that only the content of an existing set can be referentially identified. Universal quantifiers are barred from focus position because they cannot function as predicates.

This analysis also predicts the possibility of double negation in Hungarian: either the predicate of the open sentence corresponding to the background, or the focus, or both can be negated:

- (17) a. János [_{FocP} MARIT [_{NegP} nem [_{NNP} hívta [_{TP} meg]]]]
 John Mary-ACC not invited PRT
 ‘It was Mary who John didn’t invite.’
- b. János [_{NegP} nem [_{FocP} MARIT [_{NNP} hívta [_{TP} meg...
 ‘It wasn’t Mary who John invited.’
- c. János [_{NegP} nem [_{FocP} MARIT [_{NegP} nem [_{NNP} hívta [_{TP} meg...
 ‘It wasn’t Mary who John didn’t invite.’

The focus has two distinctive prosodic features: it bears a pitch accent, and destresses the V adjacent to it. The focus following a negative particle is cliticized to the particle. A focus may be destressed also when preceded by a wide-scope universal quantifier.

As is clear from the above, the Hungarian preverbal focus cannot be identified with the carrier of new information. New information does not have to be focussed. A constituent giving a non-exhaustive answer to a *wh*-phrase usually remains in situ (18b), or is formulated as a contrastive topic (18c):

- (18) a. K_{IT} kérhetnénk fel a feladatra?
 ‘Who could we ask for the job?’
- b. Fel- kérhetnénk Pétert.
 PRT ask-COND-1PL Peter-ACC
 ‘We could ask Peter.’
- c. √Pétert fel- kérhetnénk.
 Peter-ACC PRT ask-COND-1PL
 ‘Peter, we could ask.’

In focus constructions there is a containment relation between the focus and new information. The carrier of new information can be either smaller or larger than the focus XP, and in the former case it must be contained in the focus XP (19b), and in the latter case it must subsume the focus XP (20b) (Bende-Farkas 2006):

- (19) a. MELYIK CSAPAT nyerte meg a világbajnokságot?
 which team won PRT the world-cup
 ‘Which team won the world cup?’
- b. AZ OLASZ CSAPAT (nyerte meg a világbajnokságot).
 the Italian team won PRT the world-cup
 ‘The Italian team.’
- (20) a. MI történt?
 ‘What happened?’
- b. AZ OLASZ CSAPAT nyerte meg a világbajnokságot!
 the Italian team won PRT the world-cup
 ‘It was the Italian team that won the world cup.’

5 Summary

It has been argued that the topic and the focus represent two distinct, optionally filled structural positions in the left periphery of the Hungarian sentence, associated with logical rather than discourse functions. The topic functions as the logical subject of predication. Non-individual-denoting expressions can also be made suitable for the logical subject role if they are individuated by contrast. The focus expresses exhaustive identification; it functions as a derived main predicate, specifying the referential content of the set determined by the backgrounded post-focus part of the sentence.

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Direct and Indirect Aboutness Topics*

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We propose a definition of aboutness topicality that not only encompasses individual denoting DPs, but also indefinites. We concentrate on the interpretative effects of marking indefinites as topics: they either receive widest scope in their clause, or they are interpreted in the restrictor of an overt or covert Q-adverb. We show that in the first case they are direct aboutness topics insofar as they are the subject of a predication expressed by the comment, while in the second case they are indirect aboutness topics: they define the subject of a higher-order predication – namely the set of situations that the respective Q-adverb quantifies over.

Keywords: Aboutness Topics, Indefinites, Wide Scope, Left-Dislocation, Quantificational Variability Effects.

1 Introduction

Although the notion *topic* plays an important role in descriptive as well as in theoretical linguistics, there is no general consensus as to how it is to be defined. While most linguists agree that an *aboutness-relation* holding between the topic and the rest of the clause is a necessary ingredient in the definition of topicality, it is still debated whether *discourse givenness* or *familiarity* are necessary properties of topics, too.

To grasp the intuitive content of the aboutness-concept, consider the examples in (1):

* We would like to thank Manfred Krifka, Peter Staudacher, Christian Ebert and Malte Zimmermann for discussing the issues dealt with in this paper with us.

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- (1) a. *Maria, die ist eine sehr begabte Sängerin.*
 Maria, RP¹-FEM.NOM.SING is a very talented singer.
 ‘Maria is a very talented singer.’
- b. *Peter, den hab ich lange nicht mehr gesehen.*
 Peter, RP-MASC.ACC.SING have I long not more seen.
 ‘I haven’t seen Peter for a long time anymore.’

The sentences in (1) both exemplify so-called *left-dislocation*, where an XP in fronted position is associated with a resumptive pronoun in the specifier position of CP. We follow Frey (2004) in assuming that German left-dislocated phrases which are not understood contrastively are necessarily interpreted as topics, and accordingly use left-dislocation as a topic-test, comparable to Japanese *wa*-marking (cf. Portner and Yabushita 1998).

Intuitively, both sentences in (1) are felt to mainly convey information about Maria and Peter, respectively: they are both fine as answers to questions like *What about Maria/Peter?* or commands like *Tell me something about Maria/Peter*, while they are odd as answers to questions like *Who is a very talented singer?* or *Who haven’t you seen for a long time?*² Note furthermore that the left-dislocated DPs in (1a, b) are both necessarily at least *weakly familiar*: being proper names, they can only be used felicitously if both speaker and hearer know what individuals they refer to.

Because of the prevalence of examples with proper names, definite descriptions and pronouns in the literature on topics, many linguists subscribe to the view that (weak) familiarity is a necessary property of topics (cf. Hockett 1958; Kuno 1972; Gundel 1988; Portner and Yabushita 1998). We will,

¹ *RP* is the abbreviation for *resumptive pronoun*.

² Note that both sentences are (at least marginally) acceptable as answers to such questions if the respective individuals have already been established as discourse topics in the preceding context.

however, follow Reinhart (1981; see also Molnar 1993 and Frey 2000, 2004) in assuming that *familiarity* is *not* a defining property of topics. This claim is based on the observation that not only individual denoting DPs can be sentence topics, but also unmodified indefinite DPs – while modified indefinites and other quantificational DPs are excluded from topic positions (more on this in section 2).

Concerning definites, proper names and pronouns, it is obvious that the respective DPs denote entities which have either been introduced explicitly or are at least given implicitly via shared background knowledge. On the other hand, it is well known that indefinite DPs have to be *novel*, i.e. they are not allowed to take up already existing discourse referents (cf. Heim 1982). In section 2 we will therefore (following Ebert and Endriss 2004 and Endriss in preparation) introduce a definition of *direct* aboutness topicality that not only works for both individual denoting DPs and unmodified indefinites, but which also accounts for the fact that other quantificational DPs cannot be aboutness topics. In addition, we will see that the necessary wide-scope interpretation of topical indefinites in sentences with other quantificational DPs is a natural consequence of this concept of aboutness topicality.

At the same time, it is well-known that topical indefinites in the presence of adverbial quantifiers also receive an interpretation which at first sight does not seem to fall under our concept of aboutness topicality: they can be interpreted in the restrictor of a Q-adverb, giving rise to so-called *Quantificational Variability Effects* (QVEs)³ (cf. von Stechow 1994). This

³ This name is due to the fact that in these cases the quantificational force of the topical indefinite seems to depend on the quantificational force of the respective Q-adverb, as witnessed by the paraphrase in (2a). Note, however, that we assume this to be an indirect effect of a quantification over (minimal) situations each which contains exactly one individual of the respective kind (see below).

phenomenon is exemplified by the sentences in (2a, c), which have prominent readings that can be paraphrased as in (2b, d), respectively:

- (2) a. *Ein Tintenfisch, der* *ist meistens intelligent.*
 A squid, RP-MASC.NOM.SING is usually intelligent.
 ‘A squid is usually intelligent.’
- b. Most squids are intelligent.
- c. *Eine Mahler-Symphonie, die* *ist selten kurz.*
 A Mahler-symphony, RP-FEM.NOM.SING is seldom short.
 ‘A Mahler symphony is seldom short.’
- d. Few Mahler symphonies are short.

In section 3 we propose that the indefinites in (2a, c) are the indirect aboutness-topics of a higher-order predication: they define a set of situations that the Q-adverb quantifies over. This quantification is in turn (following Löbner 2000) understood as a process where the Q-adverb specifies the degree to which the respective predicate applies to this set – namely by indicating how large a proportion of the members of the set quantified over has to be included in the set denoted by the predicate in order for the sentence to be true. Finally, we argue that topical *when*-clauses (and possibly also *if*-clauses) are the *direct aboutness*-topics of sentences with Q-adverbs.

2 Wide Scope Indefinites as Direct Aboutness Topics

2.1 The facts

Consider the examples in (3): in (3a), the left-dislocated indefinite can only be understood as having scope over the universally quantified DP (as indicated by the paraphrase). (3b), on the other hand, is ambiguous: the indefinite DP can

either be interpreted as having wide or narrow scope (as indicated by the paraphrases)⁴.

- (3) a. *Einen Linguisten, den kennt jeder.*
 A-ACC linguist-ACC, RP-MASC.ACC.SING knows everyone.
 ‘There’s a certain linguist that everyone knows.’
- b. *Einen Linguisten kennt jeder.*
 A-ACC linguist-ACC knows everyone.
 ‘There’s a certain linguist that everyone knows’ or
 ‘Everyone knows some linguist or other.’

Note furthermore that left-dislocating the modified indefinites in (4a) as well as the quantificational DPs in (4b) leads to ungrammaticality: they are unacceptable as sentence-topics.

- (4) a. * *Mehr als/weniger als/genau zwei Linguisten,*
 More than/less than/exactly two linguists-ACC,
die kenne ich.
 RP-ACC.PLUR know I.
- b. * *Jeden/keinen Linguisten, den kenne ich.*
 Every-ACC/NO-ACC linguist-ACC, RP-MASC.ACC.SING know I.

We therefore need a definition of aboutness topic that fulfils the following requirements: it needs to explain why unmodified indefinites can be sentence topics, and why the other quantificational DPs in (4) cannot⁵. And it needs to explain why topical indefinites necessarily receive wide scope interpretations.

⁴ For the purposes of this paper we abstract away from the fact that in order for indefinites to be interpreted specifically in adverbially quantified sentences, a strong accent on the determiner is required in German (cf. Endriss and Hinterwimmer to appear-a and Endriss and Hinterwimmer in preparation for discussion).

⁵ Note that the *topic condition* proposed by Ebert and Endriss 2004 and Endriss in preparation, which is summarized in section 2.2, also classifies plural universal quantifiers

2.2 The explanation

Following Reinhart (1981), we assume that in case a DP denotes an object of type e , topic-marking this DP (via left-dislocation, for example) has no truth-conditional, but only a pragmatic effect: it structures the information conveyed by the respective clause in a certain way, namely via creating an address that corresponds to the individual denoted by the topical DP, and where the information conveyed by the comment is stored. Apart from that, the respective topic-comment structure is interpreted as a generalized subject-predicate structure, where the topical DP (irrespective of case-marking, agreement relations and thematic role) is the “subject”, and the comment is the predicate applying to this “subject”. A sentence like (5a) is thus interpreted as in (5b), the final result of which is of course truth-conditionally equivalent to the case where *Peter* has not been topicalized. Furthermore, the information that the speaker likes Peter is stored under the address *Peter*:

- (5) a. *Peter, den* *mag ich.*
 Peter, RP-MASC.ACC.SING like I.
- b. $[\lambda x. \text{like}'(x, I)](\text{Peter}) = \text{like}'(\text{Peter}, I)$.

Following Ebert and Endriss (2004) and Endriss (in preparation), we assume that only individuals (objects of type e) and sets (objects of type $\langle e, t \rangle$) can legitimately serve as addresses for storing information. This creates a problem in cases where the topical DP is a generalized quantifier, i.e. an object of type $\langle \langle e, t \rangle, t \rangle$ and thus *a set of sets*. One option to overcome this problem is to

like DPs headed by *alle* (*all*), and non-exhaustive monotone-increasing quantifiers like DPs headed by *einige* (*some*) as possible topics (cf. Ebert and Endriss 2004 and Endriss in preparation for discussion).

create a *representative* of the respective generalized quantifier in the form of a *minimal witness set* (in the sense of Barwise and Cooper 1981).

A minimal witness set of a quantifier is an element of the respective quantifier that does not contain any unwanted elements. For instance, in the case of a quantifier like *three dogs*, it is a set that contains three dogs and nothing else. This minimal witness set can then function as the address where the information conveyed by the comment is stored.

In order for this to be possible, however, the denotation of the topic – which now is a set, i.e. an object of type $\langle e, t \rangle$ – has to be combined with the denotation of the comment, which is a predicate and thus also an object of type $\langle e, t \rangle$. This creates a conflict which we assume to be resolved in the following way: the elements of the minimal witness set corresponding to the topicalized quantifier are distributed over the elements of the set denoted by the comment.

The interpretation of sentences with topical quantifiers is given schematically in (6), where α_T is the topical quantifier, Q is the comment and $\min(P, \alpha_T)$ is to be read as “ P is a minimal witness set of α_T ”:

$$(6) \quad \exists P [\alpha_T(P) \wedge \min(P, \alpha_T) \wedge \forall x [P(x) \rightarrow Q(x)]].$$

It is now easy to see that interpreting a sentence like (3a) (repeated below as (7a)) along this schema (as shown in (7b)) necessarily results in a reading that is equivalent to a wide scope interpretation of the topical quantifier:

- (7) a. *Einen Linguisten, den kennt jeder.*
 A-ACC linguist-ACC, RP-MASC.ACC.SING knows everyone.
 ‘There’s a certain linguist that everyone knows.’
- b. $\exists P [a \text{ linguist}'(P) \wedge \min(P, a \text{ linguist}')$
 $\wedge \forall x [P(x) \rightarrow \forall y [person'(y) \rightarrow know'(x, y)]]].$

In addition to accounting for the interpretative effect of topicalizing unmodified indefinites in such sentences, this account can also explain why these indefinites are the only quantifiers that can be aboutness topics: in all other cases, applying the above procedure to the respective quantifier leads to unacceptable results. In the case of monotone decreasing quantifiers such as *less than two linguists* or *no linguist*, for example, the corresponding minimal witness set would be the empty set, which would obviously not be a sensible representative for the quantifier⁶. With quantifiers such as *more than two linguists*, anaphoric possibilities would be destroyed that were otherwise available, etc. (cf. Ebert and Endriss 2004 and Endriss in preparation for details).

Note finally that in cases like (8a), where the left dislocated indefinite contains a pronoun that can be interpreted as bound by the universal quantifier contained within the comment, the indefinite receives an interpretation as a functional topic that is *not* identical to a simple narrow scope interpretation, as is evidenced by the fact that a continuation like (8b) is possible, but no simple pair list enumeration (cf. Endriss in preparation for details).

- (8) a. *Ein Bild von sich, das hat jeder Schüler
A picture of himself, RP-NEUT.ACC.SING has every pupil
mitgebracht.
brought-with-him.
'Every pupil has brought a certain picture of himself.'*

⁶ In the case of quantificational determiners such as *more than two*, a minimal witness set of the respective GQ would also be a poor representative for the quantifier, because it does not mimic the dynamic behavior, i.e. the anaphoric possibilities, of this quantifier in an adequate way. In the case of *jeder (every)*, finally, the problem is that the corresponding minimal witness set of the respective quantifier is a plural set, while the respective DP, and thus the resumptive pronoun, is morphologically singular (cf. Ebert and Endriss 2004 and Endriss in preparation for details).

- b. *Nämlich sein Einschulungsfoto.*
 Namely his picture-of-first-day-at-school.
 ‘Namely the picture of his first day at school.’

3 Indefinites as Indirect Aboutness Topics

Consider again our example (2a), repeated as (9a), which is interpreted as in (9b).

- (9) a. *Ein Tintenfisch, der* *ist meistens intelligent.*
 A squid, RP-MASC.NOM.SING is usually intelligent.
 ‘A squid is usually intelligent.’
- b. Most squids are intelligent.

At first sight, this interpretation seems to be in conflict with our assumption that the left-dislocated indefinite in (9a) is an aboutness topic, too, because the interpretation strategy discussed in section 2 would yield a (strange) reading according to which there is a specific squid that is intelligent most of the time.

It is, however, possible to reconcile our view of left-dislocated indefinites as aboutness topics with the fact that such indefinites receive QV-readings in the presence of Q-adverbs if we view quantification as higher-order predication process. Seen this way, the restrictor set – i.e. the set quantified over – is the “subject” of a higher-order predication, where this higher-order predication consists in specifying the degree to which the restrictor set is contained within the set denoted by the respective matrix predicate (cf. Löbner 2000 for a similar view).

Now, in the case of quantificational DPs this relation is masked by the fact that quantificational determiners form constituents with NPs, which function as their restrictors. Accordingly, the restrictor in these cases cannot be marked as an aboutness-topic via separating it from the rest of the clause, which could then

function as the comment. In the case of Q-adverbs, on the other hand, this is possible, as Q-adverbs do not form constituents with their restrictors, but rather – occupying ν P-adjoined (base) positions – with their nuclear scopes.

Let us therefore assume that Q-adverbs, which we assume to quantify over situations exclusively (cf. Endriss and Hinterwimmer to appear-b and Hinterwimmer 2005 for arguments supporting this view), take their arguments in reverse order (seen from the perspective of determiner-quantification; cf. Chierchia 1995): they combine with the set of situations denoted by the ν P-segment they c-command at LF first, forming a predicate that can be applied to the respective topical set (cf. Hinterwimmer 2005 for details).

Now, in cases like (10a), a topical set of situations is given directly in the form of a left dislocated *when*-clause, and the sentence can be interpreted as given (schematically) in (10b):

- (10) a. *Wenn Paul in seinem Büro ist, dann ist Maria meistens glücklich*
 When Paul in his office is, then is Maria usually
 happy.
 ‘When Paul is in his office, Maria is usually happy.’

- b. $[\lambda Q \langle s, t \rangle . \text{Most } s [Q(s)] [\text{happy}'(\text{Maria}, s)]] (\lambda s . \text{in-his-office}'(\text{Paul}, s))$
 $= \text{Most } s [\text{in-his-office}'(\text{Paul}, s)] [\text{happy}'(\text{Maria}, s)].$

In an example like (10a), the left-dislocated *when*-clause is thus the *direct* aboutness topic, being the “subject” of the higher-order predication expressed by the comment. In a case like (9a), on the other hand, no such *direct* aboutness

topic is given, as the left-dislocated indefinite denotes a set of sets of relations between individuals and situations⁷, not a set of situations, as shown in (11).

We assume that in order to fix this mismatch, there is a second possibility available (in addition to the one discussed in section 2) to turn an indefinite into a set that can serve as an address for storing information: it can be turned into a set of situations via a simple type-shift, namely by applying the predicate $\lambda x \lambda s. in(x, s)$ to it (cf. Hinterwimmer 2005 for details). This gives us a set of situations each of which contains an individual of the respective kind, as shown in (11) for the left-dislocated indefinite from example (9a)⁸:

$$(11) \quad [\lambda Q_{\langle e, \langle s, t \rangle \rangle}. \lambda s. \exists x [\text{squid}'(x) \wedge Q(x, s)]] (\lambda x \lambda s. in(x, s)) = \lambda s. \exists x [\text{squid}'(x) \wedge in(x, s)]$$

This set of situations can then function as the aboutness topic in cases like (9a), and the left-dislocated indefinite can be seen as the *indirect* aboutness topic of such sentences, as the *direct* aboutness topic, i.e. the set of situations in (11), has been derived from the denotation of the respective indefinite.

In order to derive the reading we are after in cases like (9a) (which is repeated below as (12a)), we have to assume that the resumptive pronoun in the specifier position of CP is reconstructed into its ν P-internal base position, where it is interpreted as a free variable (i.e. just like an ordinary pronoun) that can be

⁷ Since situations are now part of the picture, we have to assume this slightly more complicated denotation of quantifiers for reasons of consistency (as can be seen in the formula in (11)). Of course, we assume that this also holds for the quantifiers discussed in section 2, where we abstracted away from this complication, since it was not relevant at this point.

⁸ We assume that in the case of left-dislocated bare plurals basically the same mechanism applies, modulo the fact that bare plurals denote kinds which have to be turned into plural indefinites in cases where they are to be combined with non-kind-level predicates (see Hinterwimmer 2005 and the references cited therein for further discussion).

dynamically bound by the indefinite in the restrictor of the Q-adverb.⁹ This gives us a higher-order predicate that can be applied to the topical set, as shown in (12b), resulting in an interpretation that can be paraphrased as “Most (minimal) situations that contain a squid are situations where this squid is intelligent”¹⁰:

(12) a. *Ein Tintenfisch, der* *ist meistens intelligent.*
 A squid, RP-MASC.NOM.SING is usually intelligent.
 ‘A squid is usually intelligent.’

b. $[\lambda Q \langle s, t \rangle. \text{Most } s [Q(s)] [\text{intelligent}'(x, s)]] (\lambda s. \exists x [\text{squid}'(x) \wedge \text{in}(x, s)])$
 $= \text{Most } s [\exists x [\text{squid}'(x) \wedge \text{in}(x, s)]] [\text{intelligent}'(x, s)]$

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⁹ We assume that in the cases discussed in section 2 the resumptive pronoun is interpreted in the specifier position of CP, triggering lambda-abstraction and thus creating an individual predicate, in analogy to relative pronouns (cf. Endriss and Hinterwimmer in preparation for details and further motivation).

¹⁰ The formal representations we give in this section are strongly simplified, as they do not incorporate the minimality condition that is necessary in order to get readings that are equivalent to a direct quantification over individuals (cf. von Stechow 1994 and Hinterwimmer 2005 for discussion).

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Information Structure as Information-based Partition^{*}

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While the *Information Structure (IS)* is most naturally interpreted as 'structure of information', some may argue that it is structure of something else, and others may object to the use of the word 'structure'. This paper focuses on the question of whether the informational component can have structural properties so that it can be called 'structure'. The preliminary conclusion is that, although there are some vague indications of structurehood in it, it is perhaps better understood to be a representation that encodes a finite set of information-based partitions, rather than structure.

Keywords: Partition, Topic, Recursivity, Second Occurrence Focus

1 Introduction

Let me begin this paper with the honest confession: The term *Information Structure (IS)*, which goes back to Halliday (1967), is perhaps a little confusing. Without any theoretical biases or inclinations, one would most naturally interpret the term as 'structure of information'. I anticipate, however, that this way of interpreting it invites objections from those working on IS and related issues.

Some would argue that IS refers to a representation of linguistic objects that has structural properties. The information itself is not a linguistic object, so it does not make sense to say that IS is structure of information. The first half of the compound 'information' should, therefore, be interpreted as a modifier of

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some sort, meaning 'informational', 'information-based', 'information-related' or something along that line. One of the most prominent advocates of this view is Erteschik-Shir (1997), whose f(ocus)-structure is an annotated S-structure that encodes fore-ground/back-ground information. This f-structure is meant to replace LF as the input representation to the semantic translation, and there are a finite set of mapping algorithms that connect f-structure and the file-card semantic system fashioned after Heim (1982, Chapter 3). Although similar approaches are found in Vallduv□ (1992) and Lambrecht (1994), I think that Erteschik-Shir's approach is more 'structural' than its alternatives.¹ As a replacement to LF, f-structure is where scope is computed, and it is determined in structural terms at that level.² Erteschik-Shir also provides f-structural (re)analyses of many syntactic phenomena, ranging from extraction out of islands and crossover phenomena to anaphora binding. The existence of subordinate f-structure gives additional hierarchical flavor to f-structure.

While a sizable contingency of IS researchers assume the thesis of 'IS as a linguistic representation', it seems that there are still many others, myself among them, who use the term 'Information Structure' without commitment or belief that it entails the existence of an independent linguistic representation, like Erteschik-Shir's f-structure. For those, IS tells us the state of affairs of information or it says something about how information is organized. Although it is a representation of non-linguistic objects, IS is still considered linguistically relevant because the way information is organized has significant impact on linguistic structures of different modules. Within this view, one can still make an

¹ Erteschik-Shir compares her approach to the two alternatives mentioned above in her book (Erteschik-Shir 1997, 1.8, p.55-56).

² Unlike in the 'Transparent LF' (the term borrowed from von Stechow), the position of a quantifier at f-structure does not play a deterministic role in scope. For instance, Q1 sits lower than Q2 but takes scope over Q2 if Q1 is co-indexed with a topic. See Erteschik-Shir (1997: 5.3.) for more discussion.

objection to the idea of 'Information Structure as structure of information', but the objection is not about 'of information' but of the choice of the word 'structure'.

2 Structure vs. Partition

The key notions often cited in connection to IS are essentially bi-partite: Theme vs. Rheme, Topic vs. Comment/Focus, Ground vs. Focus, Given vs. New, and perhaps a few others like them. The question is whether this 'informational partition' should be described as structure.

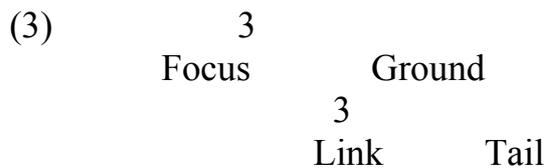
The notion of 'structure' has played a central role in shaping up modern linguistic theories. We are indeed quite used to using structure at so many different levels and have come to expect certain properties from it. For instance, (1) is often associated with a linguistic representation that has structural properties.

- (1) The existence of hierarchy, and/or the fixed hierarchical ordering of primitives.

There are numerous instances that exemplify (1): X-bar Schema in Syntax ($X^0 - X' - XP$) or Prosodic Hierarchy in Phonology (segment – mora – syllable – foot ...). It is also worth pointing out that (1) has led to the emergence of relational notions that are defined in structural terms. C-command in syntax is perhaps among the most recognizable ones. Almost all of notions of locality in syntax are structure-sensitive as well.

How about information structure? Does it have any attributes that can be described as hierarchical? Are there any structural notions that are relevant to this level of representation? I suspect that I am not the only one who is inclined to say 'no' to these questions. The various ways of partitioning in the information

component, like those I listed above, do not seem to encode any hierarchy in any obvious way. Nor are there any relational notions for IS that are based on hierarchical structure. One potential exception to this generalization is Vallduví's (1992) version of *Information Packaging*, which partitions information into Focus and Ground, the latter of which is further divided into Link and Tail.



This classification does look hierarchical, but despite its appearance, the representation does not make any use of the hierarchy, nor does it have any isomorphic mapping relations to other representations. For instance, Link can be regarded structurally lower than Focus in this representation, but such a structural asymmetry does not correlate with semantic scope. The general scope tendency often noted in the literature (e.g., Erteschik-Shir 1997, Krifka 2001a) is that the element that corresponds to Link (often equated to a topic) takes the widest scope.

Although informational partitioning itself is not enriched enough to encode structural ordering, IS can still show hierarchical properties if it has another well-known structural property in linguistics, namely (4).

- (4) Recursivity or embeddability of a part of structure within a larger part.

IS seems to fare better with this criterion. One empirical phenomenon that may call for recursivity in information partitioning is the nested foci or the second occurrence focus phenomenon that has attracted a lot of attention lately (cf. Krifka 1991, Beaver et al. 2004, Féry and Ishihara 2005, Rooth 2006, Buring 2006).

- (5) A: Bill only eats VEgetables.
 B: FRED also only eats vegetables.

In this example, B's utterance has focus on the subject NP *Fred*, which is associated with the focus-sensitive adverb *also*. Although the VP *only eats vegetables* should be regarded as the background (or whatever one assumes to be the opposite to focus), the semantics of *only* requires the presence of focus-marking on its associate, namely the object NP *vegetables*. This situation can be interpreted as the recursive Focus-Background partition within the matrix background portion, as in (6).

- (6)
- | | | |
|-------|------------|------------|
| 3 | | |
| Focus | Background | |
| | 3 | |
| | Focus | Background |

I have been ignoring one important detail here, however. On the one hand, the issue of the second occurrence focus is discussed most frequently in connection with 'association with focus', a popular phenomenon among formal semanticists in which focus affects truth conditions (in case of *only* or *always*) or presuppositions (in case of *also* or *even*). The information-based partitions, on the other hand, come from more pragmatic or discourse-oriented frameworks. In other words, the second occurrence focus, which is motivated by the semantics of a focus-sensitive adverb, may or may not be integrated comfortably in the information-based partition in the way that it renders support for the idea of the recursivity in IS. Even if we clear this issue, there is another pressing question: How many levels of embedding are possible? We can certainly add another layer to the example (5).

- (6) A: Bill only eats VEgetables.
 B: FRED also only eats vegetables.
 A: Well, you THInk Fred also only eats vegetable, but actually he quit being a vegetarian.

While there can be more than two layers of partitioning, it is still unclear whether we need to make a distinction between the second occurrence and the third occurrence foci. Should the previous embedding structure be preserved under additional embedding, just like how embedding works in syntax?

All in all, it can be speculated that the second occurrence focus calls for structural IS, but it presents more questions than answers.

3 Embedded Topics in Japanese

More promising evidence for the recursivity or embeddability in the information component is the recursive topic marking in Japanese and Korean, which have morphological marking for topicality.³ As the following Japanese example shows, the topic-marking with the topic particle *wa* can be reiterated under the syntactic embedding.

- (8) A: What did Ken say?
 B: Ken-**wa** [Erika-**wa** baka-da]-to itta
 Ken-TOP Erika-TOP fool-cop-COMP said
 'Ken said Erika is a fool.'

³ The view that *wa* is the marker of a topic was popularized by Susumu Kuno (e.g., Kuno 1973) but was recently challenged by Kuroda (2005). One of Kuroda's main arguments is that *wa* phrase can be used as an answer to a Wh-question, which is often regarded as the sign of being focused. Kuroda was very careful in making his point by eliminating non-exhaustive, partial answers, which he correctly identify as contrastive uses of *wa*. However, his crucial examples ((11) and (12) in p.9), judged acceptable by Kuroda, do not get universal approval. All speakers that I consulted (and myself) find them still odd. The common feeling among us is that the sentences themselves are fine, but they are not really answering the question. At this point, I cannot offer anything more substantial and leave this issue for future research.

First, it is not the case that a topic marking can be found in any embedded clause. Kuroda (2005) and Portner (2004) independently note that *wa*-marking in an embedded clause is possible when there is a presence of the agent of a cognitive act, such as believing, thinking or doubting, or of a speech act, such as saying or reporting in the embedded clause. Thus, embedding topics are found most typically in complement clauses of verbs of attitude reports. On the other hand, they cannot appear in relative clauses or in certain adjunct clauses (e.g., *when*, *if*, etc.). I am not too optimistic of the prospect that this restriction is derivable entirely from informational properties: Given/New, Topic/Comment, Theme/Rheme partitions cannot be easily used explain the subtle distinctions among various embedding structures. Second, embedded topics do not share all the characteristics that matrix topics have. Kuroda (1965) observed, for instance, that with an individual-level predicate, the nominative subject necessarily induces the exhaustive interpretation while the topic subject gets the neutral interpretation.

- (11) a. John-ga zurugasikoi
 John-nom sly
 Exhaustive reading: Of all the relevant people, it is John who is sly.
- b. John-wa zurugasikoi
 John-top sly
 Neutral reading: Speaking of John, he is sly.

Heycock (1994) accounts for the contrast by making appeal to the concept of competition between a topic and a nominative. A nominative subject gets focalized interpretation when it could have been marked with *wa* but isn't. Interestingly, the obligatory exhaustive reading is not applicable to embedded nominative subjects.

- (12) Erika-wa [_{CP} John-ga zurugasikoi to] omo-ttei-ru
 Erika-top John-nom sly Comp think-prog-pres
 ‘Erika thinks that John is smart’ (Neutral reading possible)

For some reason, the notion of competition between *wa* and *ga* does not arise in embedded contexts despite the fact that embedded topics are possible. This needs to be accounted for, and as far as I know, there has not been any satisfactory explanation proposed.

4 Summary

There are a few signs of structural attributes in Information Structure. All in all, we have to admit, however, that structure in IS is rather rudimentary, and that we have to look hard for linguistic relevance that such structural characters may bring about. The question remains whether we should continue to allow ourselves to use the term without believing that it is structure. My inclination is that, as long as we share the understanding that IS is a representation, not necessarily structural, where a finite set of bi-partite distinctions apply, there is not much harm in using it.

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Focus Presuppositions

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This paper reviews notions related to focus and presupposition and addresses the hypothesis that focus triggers an existential presupposition. Presupposition projection behavior in certain examples appears to favor a presuppositional analysis of focus. It is argued that these examples are open to a different analysis using givenness theory. Overall, the analysis favors a weak semantics for focus not including an existential presupposition.

*Keywords: focus, presupposition, alternative semantics
presupposition projection, givenness.*

1 Introduction

In my contribution to this volume of papers on notions of information structure, I will present notions related to focus and presupposition by working through a single theoretical argument, and defining the notions which are appealed to as I go. The argument I want to go through has to do with the possibility of sentences with intonational focus, such as sentence (1), introducing an existential presupposition. More specifically, it is about the claim that presupposition transformation behavior provides an argument that focus can contribute an existential presupposition (Guerts and van der Sandt 2004, Abusch 2005).

(1) Lana_F ate the leftovers.

The notation F represents a focus feature, as introduced in Jackendoff (1972). The feature is formally a syntactic one, but it functions mainly to link the phonology of focus which is a pitch accent or other kind of phonological prominence, with the semantics and pragmatics of focus. Three options for the semantics of focus have particular prominence in current theoretical discussion. According to alternative semantics (Rooth 1985), focus in (1) introduces a set of ‘alternative’ propositions which are obtained by making substitutions in the position of the focused phrase:

- (2) Alternative set (a set of propositions)
 $\{ \lceil \text{Lana ate the leftovers} \rceil, \lceil \text{Mona ate the leftovers} \rceil, \lceil \text{Nina ate the leftovers} \rceil, \lceil \text{Orna ate the leftovers} \rceil, \dots \}$

In this paper, I will use the corner brackets seen in (2) as a notation for naming propositions. In a semantics where sentences denote propositions, sentence (1) denotes the proposition $\lceil \text{Lana ate the leftovers} \rceil$. According to alternative semantics, it also contributes the alternative set (2).

The second theory of focus semantics I want to talk about is a presuppositional one, where it is claimed that sentence (1) presupposes that someone ate the leftovers (Guerts and van de Sandt 2004). We obtain the effect of existentially quantifying the focused position by forming the disjunction of all the propositions in the alternative set, as shown in (3). The resulting proposition is called the *focus closure* of example (1). The disjunction is true if and only if one of the disjuncts is true, so the focus closure is the proposition (4).

- (3) $\lceil \text{Lana ate the leftovers} \rceil \vee \lceil \text{Mona ate the leftovers} \rceil \vee \lceil \text{Nina ate the leftovers} \rceil \vee \lceil \text{Orna ate the leftovers} \rceil \vee \dots$

(4) 「someone ate the leftovers」

(5) gives the general definition of focus closure, using the notation $\cup C$ for the disjunction (possibly an infinite disjunction) of the propositions in a set C .

(5) Focus closure

$\cup C$, where C is the alternative set associated with the focus

So, the presuppositional semantics for focus maintains that the focus closure is presupposed. Another theory of focus semantics that uses the focus closure is the *givenness* semantics (Schwarzschild 1999). This is the third theory of focus which I discuss in this paper. It is introduced in section 4.

2 Compositional Tests for Presupposition

What is meant by “presupposed”? Assumptions about presupposition have a semantic and a pragmatic part. According to compositional semantic theories of presupposition, the information contributed by a sentence can be viewed as packaged into two parts, a presupposed proposition and an asserted proposition. For sentence (6), the presupposed proposition is that John has some cars, and the asserted proposition is that the transmission on any car which John has is a manual transmission. The latter is stated in such a cumbersome way because one wants to avoid describing the asserted proposition using a sentence which itself has presuppositions.

(6) John’s cars have manual transmissions. (φ in the next example)

(7) $\text{pres}(\varphi) = \text{「John has some cars」}$

$\text{ass}(\varphi) = \text{「any car that John has has a manual transmission」}$

An argument for the division into presupposition and assertion is that the presupposed and asserted parts are treated differently by compositional semantic rules. For instance, when a sentence is negated, the assertion is semantically negated, but the presupposed part is preserved. For instance as shown in (8), the negation of sentence (8) still has the implication that John has some cars.

- (8) John's cars don't have manual transmissions.
 $\text{pres}(\neg\phi) = \lceil \text{John has some cars} \rceil$

Compositional contexts where presuppositions are preserved are known as presupposition *holes* (Karttunen 1973). Another hole is the *if*-clause of a conditional, as exemplified in (9). The complex sentence (9), which has the form [if ϕ ψ], has the implication that John has some cars, indicating that the presupposition of the *if*-clause ϕ has been inherited by the complex sentence.

- (9) If John's cars have manual transmissions, I don't want to borrow one.
 presupposition: John has some cars.

Together, the collection of presupposition hole contexts is the “family” of hole contexts. These hole contexts are used as a test for presuppositions. If one has a sentence ϕ which has an implication ϕ' , and one wants to find out if ϕ' is a presupposition, one plugs ϕ into a hole context in a complex sentence, and checks whether the implication ϕ' is inherited by the complex sentence. If it is, this is indicative of a presuppositional status of ϕ' .

As an illustration, let's apply the test to sentence (6). We start with the intuition that (6) implies that John has some cars. To test for presuppositional status, we check implications of the negated sentence (8), and the *if*-sentence (9). Intuitively, both imply that John has some cars. This is considered evidence that the implication of the original sentence that John has some cars is

presuppositional. The negation part of this procedure is known as the *negation test* for presuppositional status of an implication. The whole thing is known as the ‘family of sentences’ test, referring to the family of presupposition holes.

To apply the negation test to the focus example (1), we start with the observation that (1) implies that someone ate the leftovers. Then we check whether the negation of (1), which is (10), also has that implication. There is an intuition that it does, in that someone who used (10) would normally intend to convey that someone other than Lana had eaten the leftovers.

(10) Lana_F didn’t eat the leftovers.

In (11), the *if*-hole context is applied to (1). Intuitively, the *if*-sentence implies that John has some cars. This again counts as evidence that (6) presupposes that John has some cars.

(11) If John’s cars have manual transmissions, he must be a handy person.

In example (12), the *if*-hole test is applied to the focus sentence (1). Intuitively, the *if*-sentence implies that someone ate the leftovers. This is evidence that sentence (1) has an existential presupposition.

(12) If Lana_F ate the leftovers, that would explain why she is nauseous.

I should point out that the intuition that (12) implies that someone ate the leftovers is unstable. It is possible to make the existential implication go away by adding more context, as in (13).

- (13) A: Did anyone finish the leftovers?
 B: I don't know. If Lana_F ate the leftovers, that would explain why she is nauseous.

There are other families of contexts where presuppositions are transformed in particular ways. In the conditional family, the presupposition of φ in a complex sentence which has sub-sentences ψ and φ is compositionally weakened to $\text{ass}(\psi) \rightarrow \text{pres}(\varphi)$. An example of the conditional context for φ is the negated main clause of a conditional, where the *if*-clause is ψ . Consider sentence (14a). Intuitively, it implies that if the sample was analyzed, then it was tested for Polonium. (This might be true because of the circumstances of a certain police investigation.) The *if*-sentence (14a) with its negated main clause has the constituents shown in (14b). Sentence φ intuitively has the implication that someone tested the sample for Polonium. This is the φ' which is being tested for presuppositional status.

To complete the test we check in our intuitions whether the complex sentence has the implication (14c). It does, so this is evidence of φ' being a presupposition of φ .

- (14) a. If the sample was analyzed, it wasn't Trevor who tested it for Polonium.
- b. ψ [the sample was analyzed]
 φ [it was Trevor who tested it for Polonium]
 φ' someone tested the sample for Polonium
- c. $\text{ass}(\psi) \rightarrow \varphi'$
 If the sample was analyzed, someone tested the sample for Polonium.

Notice that it is the combination of the *if*-construction and the main clause negation which is being used as the test context. More precisely, since we want

to indicate the position of both ψ and ϕ , the context is *if ψ not ϕ* . Why not use the simpler *if ψ ϕ* ? This is tried out in (15).

- (15) a. If the sample was analyzed, it was Trevor who tested it for Polonium.
- b. ψ [the sample was analyzed]
 ϕ [it was Trevor who tested it for Polonium]
 ϕ' someone tested the sample for Polonium
- c. $\text{ass}(\psi) \rightarrow \phi'$
 If the sample was analyzed, someone tested the sample for Polonium.

The constituent ϕ has the implication ϕ' , which we want to test for presuppositional status. Intuitively, the complex sentence (15a) has the implication (15c). Is this evidence for presuppositional status of ϕ' ?

It isn't, because in the context *if ψ ϕ* , assertions of ϕ are transformed in the same way. This is illustrated in (16). The main clause ϕ has the implication ϕ' , which is in fact an entailment of $\text{ass}(\phi)$. The complex sentence (16a) intuitively has the implication $\text{ass}(\psi) \rightarrow \phi'$. This shouldn't lead us to the incorrect conclusion that ϕ' is a presupposition of ϕ .

- (16) a. If the sample was analyzed, Trevor tested it for Polonium.
- b. ψ [the sample was analyzed]
 ϕ [Trevor tested the sample for Polonium]
 ϕ' someone tested the sample for Polonium
- c. $\text{ass}(\psi) \rightarrow \phi'$
 If the sample was analyzed, someone tested the sample for Polonium.

This example shows that an adequate compositional test for presupposition involves a context where presuppositions are transformed in certain

characteristic ways which are distinct from the way that assertions are compositionally transformed. If we nevertheless want to make an argument based on (15), we need to argue in an independent way that the implication $\text{ass}(\psi) \rightarrow \phi'$ of the complex sentence is a presupposition.

Now I would like to apply the context *if ψ not ϕ* to test for a focus existential presupposition of the focus sentence (17a). Notice that this is a pure-focus version of the cleft sentence (17b) which we worked with above. So the logic will be parallel.

- (17) a. Trevor_F tested the sample for Polonium
 b. It was Trevor who tested the sample for Polonium.

The test sentence is (18).

- (18) If the sample was analyzed, Trevor_F didn't test it for Polonium.

The breakdown into constituents, which is given in (19), is parallel to (14b). We start with the intuition that the constituent ϕ has an implication ϕ' that someone tested the sample for Polonium, and want to test whether this implication is a presupposition.

- (19) ψ [the sample was analyzed]
 ϕ [Trevor_F tested it for Polonium]
 ϕ' someone tested the sample for Polonium

In checking intuitions about (18), we should allow for a variety of intonational patterns which include a lot of prominence on *Trevor*. This is because we want to consider representations where *Trevor* is focused, but aren't sure what the optimal intonation pattern is for the sentence as a whole. For instance, in a very

natural pronunciation of the cleft sentence (15a), there is prominence on *Polonium*. So we should consider pronunciations of (18) where there is prominence on *Polonium*, together with prominence on *Trevor*.

In fact, there is reason to suspect that a *B accent* or *topic accent* would fit into this context (Jackendoff 1972, Büring 1997). A context which triggers topic accents is shown in (20). A background multiple-wh question is broken down into sub-questions. The sub-question *who tested it for Polonium* triggers in the answer a focus accent on *Trevor*, and a topic accent on *Polonium*. Topic accent is arguably a sub-species of focus accent.

- (20) (Who tested it for what radioactive element?...
 Who tested it for radium?...
 What about Polonium? Who tested it for that?)
 Trevor_F tested it for Polonium_T.

Since sentence (18) can suggest a number of tests were performed, there might be an implicit topic ‘who tested the sample for Polonium’ which would trigger the focus/topic intonation pattern. In fact this pattern works very well in the positive version (21) of (18). Introspectively, the topic accent can be perceived as a “rising” accent, in contrast to a “falling” focus accent.

- (21) If the sample was analyzed, Trevor_F tested it for Polonium_T.

What are the results of this experiment? I have a hard time finding the intuition that any pronunciation of (18) with a focus accent on *Trevor*, or any specific semantic or pragmatic reading of such a pronunciation of (18), really presupposes that if the sample was analyzed, then someone tested it for Polonium. I have the intuition that sentence (18), with focus on *Trevor*, leaves open the possibility that a test of the sample might not have included a test for

Polonium. This contrasts strongly with the cleft version (14a). If this intuition is correct, it indicates that focus does *not* trigger an existential presupposition.

What about (21)? I think that someone who used this sentence could naturally be understood to be taking for granted that if the sample was analyzed, someone tested it for Polonium. This notion of “taking for granted” is our next topic. But for the reason discussed above, this example is not a clear argument for focus existential presupposition, because in the context with an un-negated main clause, assertions are compositionally transformed in the same way as presuppositions.

3 Common Ground Pragmatics for Presupposition

So far, in trying to identify presuppositions of sentences and in testing whether focus triggers a presupposition, we have just been checking intuitions about “implications” of sentences. The asserted component of meaning is also an implication of a sentence. We can imagine a language similar to English where presuppositions are components of meaning which have a special system of compositional semantics, but which at the end they have exactly the same pragmatic status as assertions. This language would differ from English not in compositional semantics, but in the pragmatic interpretation of the semantic objects which compositional semantics provides. In this language, the compositional phenomena themselves would be the only motivation for the distinction between presupposition and assertion. Arguably these compositional phenomena are systematic enough to motivate the distinction by themselves.

In the real English, the pragmatic interpretation of presuppositions is not equivalent to the pragmatic interpretation of assertions. There are unstable intuitions that presuppositions are somehow “taken for granted,” things the speaker presents as being already known by the hearer. There is an idealized

theory which brings out this intuition. In a conversation where two speakers are exchanging information cooperatively, a common store of shared information builds up. It consists of things the speakers have agreed about. At any point in the conversation, we can check whether a given proposition follows from the current store of common information, which is called a common ground (Stalnaker 1974). This is the pragmatic interpretation of presupposition: using a sentence ϕ is appropriate only if the current store of shared information entails $\text{pres}(\phi)$.

In real conversations, the common-ground constraint is often not observed. Suppose we don't know each other very well at all. After a talk, I tell you (22). A BlackBerry is a portable email device used in entertainment and business circles. By compositional criteria, that I have a BlackBerry is a presupposition of the second sentence in (22). According to the constraint, I should use the sentence only if it follows from our store of common information that I have a blackberry. In fact before hearing (22) you knew nothing about it, and you are surprised to learn that I have one, since I am a linguist rather than a rapper or a businessman. However, my utterance is not at all perceived as inappropriate.

(22) I can't contact Mark about the dinner arrangements right now. My BlackBerry is out of range.

As it is used in theoretical arguments, the common-ground pragmatics for presupposition can be taken as an idealized theory which is useful in theorists' armchair experiments. In arguing that an implication is a presupposition, theorists refer to intuitions about the implication tending to be taken for granted, in addition to applying the compositional tests I discussed above. There are attempts at constructing a more realistic theory building on the common ground pragmatics in Stalnaker (2002) and von Stechow (2006).

4 Another Analysis of the Conditional Presupposition

Above I said that there was an intuition that (21) has a conditional presupposition. The evidence is contradictory, because the negated conditional (18) was evidence against the hypothesis that focus triggered a presupposition.

In Abusch (2005) I used data similar to (21) as part of an argument for a pragmatic mechanism which optionally generates an existential presupposition for focus. (23) was my example. Intuitively, focus here is supported by the assumption that the Trust Company keeps all its valuables in the vault, so that if Abner and Lena robbed the Trust Company, then someone opened the vault. This is the conditional presupposition we experience. I treated this as evidence for a focus presupposition, in partial agreement with Guerts and van der Sandt (2004).

(23) If Abner and Lana robbed the Trust Company, then she_F opened the vault.

Now I am going to question this argument by looking at another example where a conditional presupposition is observed with focus. In (24), intuitively the focus is licensed by the same conditional assumption we saw before, namely that if Abner and Lana robbed the trust company, then someone opened the vault.

(24) Abner and Lana shouldn't rob the trust company if you_F already opened the vault.

Unlike before, in this example the focus is not in a position where an existential presupposition would be locally satisfied. The focus is in the *if*-clause of a conditional, and the antecedent for the focus is in the preceding main clause. Before, in the discussion related to (14), we saw that the main clause of an *if*-sentence is in the conditional family of presupposition transformers. But the *if*-

clause itself is in the hole family, meaning that presuppositions of the *if*-clause project. This is illustrated in (11). This sentence has an initial *if*-clause, but the situation is the same for a version with a final *if*-clause as in (23). So, a presupposition in an *if*-clause is not compositionally transformed. Even if focus triggered an existential presupposition, that would not explain our intuitions about (24), because a presupposition $\text{pres}(\varphi)$ of φ in the context $[\psi \text{ if } \varphi]$ is not transformed to $\text{ass}(\psi) \rightarrow \text{pres}(\varphi)$.

(25) John must be a handy person if his cars have manual transmissions.

A minimal contrast with focus is provided by the *it*-cleft. In (26), a cleft is substituted for focus in (25). In this sentence, the cleft presupposition in the *if*-clause is not satisfied by the information in the main clause, in contrast with the situation for focus in (24). It is in fact hard to contextualize or make sense of sentence (26), while it is possible to contextualize (24).

(26) Abner and Lena shouldn't rob the trust company if it is you_F who (already) opened the vault.

Where does this leave us? A conditional presupposition is observed in (24). But it is not possible to attribute this to compositional transformation of an existential presupposition associated with the focus. This is indicated both by the contrast with (26), and by the fact that theories of presupposition projection do not predict conditional transformation of presuppositions in this context. So the conditional presupposition we see in (24) must have some other source.

In fact it is no mystery what this source is. Lakoff (1971) pointed out that focus can be licensed via an entailment relation. A pure example of this is (27), which exploits the fact that the first clause entails that John moved the vase.

This entailment relation results from the lexical and compositional semantics of the predicates *carry upstairs* and *move*. Lakoff pointed out that examples like (28) exploit contextual assumptions, here the assumption (a controversial one) that calling someone a Republican entails insulting them.

(27) First John carried the vase upstairs, then Mary_F moved it.

(28) First John called Mary a Republican, then she_F insulted him_F.

Entailment was built into a theory of focus semantics by Schwarzschild (1999) in his givenness semantics for focus. Restricting attention to a special case of his licensing condition, focus is licensed if there is an antecedent in the discourse which entails the focus closure. In (27) the focus closure is \lceil someone moved the vase \rceil , which is entailed by the first clause in (27), so the focus is licensed. The same story applies in (26), except that one must allow contextual assumptions to be used in computing entailment.

Now let's apply an analysis using givenness licensing to the focus example (23), using the *if*-clause as the antecedent in givenness licensing of focus. The focus constraint is that contextual assumptions together with the antecedent 'Abner and Lana robbed the trust company' entail that someone opened the vault. Equivalently, it must follow from the auxiliary assumptions that if Abner and Lana robbed the trust company, then someone opened the vault. This is exactly the conditional presupposition we experience. The entailment presupposition is now being derived directly in focus theory, rather than in a compositional account of presupposition. An advantage of this is that the analysis carries over to examples like (26) which are not in the conditional family of presupposition transformers.

The conclusion of this argument is that we should not consider example (23) evidence for a focus existential presupposition, because it can be given a different analysis. And overall, the data discussed in this paper favor a weak semantics for focus, not including anything as strong as an existential presupposition.

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Contrastive Focus, Givenness and the Unmarked Status of “Discourse-New”*

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New evidence is provided for a grammatical principle that singles out contrastive focus (Rooth 1996; Truckenbrodt 1995) and distinguishes it from discourse-new “informational” focus. Since the prosody of discourse-given constituents may also be distinguished from discourse-new, a three-way distinction in representation is motivated. It is assumed that an F-feature marks just contrastive focus (Jackendoff 1972, Rooth 1992), and that a G-feature marks discourse-given constituents (Féry and Samek-Lodovici 2006), while discourse-new is unmarked. A crucial argument for G-marking comes from second occurrence focus (SOF) prosody, which arguably derives from a syntactic representation where SOF is both F-marked and G-marked. This analysis relies on a new G-Marking Condition specifying that a contrastive focus may be G-marked only if the focus semantic value of its scope is discourse-given, i.e. only if the contrast itself is given.

Keywords: contrastive focus, givenness, second occurrence focus, F-marking, G-marking, prosody

1 Introduction

This note addresses two related controversies concerning the grammar of focus¹. One concerns the phonology of contrastive focus. The other concerns the question whether the syntactic representation of contrastive focus overlaps in any way with the syntactic representation of discourse-newness/discourse-givenness, which is sometimes referred to as informational focus.

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¹ The present paper consists of sections of a longer paper “Contrastive focus, givenness and phrase stress” (Selkirk 2006b). As the title suggests, the issue of phrase stress is treated in more detail in the longer paper.

The term ‘contrastive focus’ will be used here to designate the status of a constituent in sentences like *I gave one to Sarah, not to Caitlin*, or *I only gave one to Sarah* where the meaning of the sentence includes a specification that there exist alternatives to the proposition expressed by the sentence which are identical to that proposition except for different substitutions for the contrastively focused constituent². The alternatives set here would include {I gave one to Sarah, I gave one to Caitlin, I gave one to Stella, ...}. This type of focus has a direct role in determining the semantic interpretation of the sentence, affecting truth conditions and conversational implicatures. There are widely different views about whether in English contrastive focus constituents are fundamentally any different in their prosodic prominence from noncontrastive constituents, and about whether, in cases where a difference might appear, this is a consequence of a different grammatical representation or rather the effect of some optional paralinguistic emphasis for contrastive focus. In the last decade or so certain scholars of the focus-prosody interface have articulated the view that principles of grammar do not assign contrastive focus any distinctive prominence (Ladd 1996, Gussenhoven 2004), while others have proposed that contrastive focus is subject to a special grammatical principle for the assignment of phrase stress which can lead to a grammatically represented prominence distinction between contrastive focus and noncontrastive constituents (Truckenbrodt 1995, Rooth 1996b, Selkirk 2002, 2006ab, Féry and Samek-Lodovici 2006, Büring 2006).

² This type of focus is referred to variously as contrastive focus, identificational focus, alternatives focus, or simply focus (Jackendoff 1972; Jacobs 1988; Krifka 1992; Rooth 1992; Rooth 1996a, Kiss 1998, Kratzer 2004).

2 The Nature of Contrastive Focus Prosody

The assumption that contrastive focus prosody is not phonologically distinct is found in the early contention by Chomsky 1971 and Jackendoff 1972 that main sentence stress (sometimes called ‘nuclear stress’) appears on constituents that may vary in their focus status. They claimed that a sentence like (1), where capitalization is used to indicate main stress,

(1) [Geach [is married [to the woman [with the [TIE]]]]]

may be appropriately used as an answer to a *wh*-question asking ‘Which woman is Geach married to?’, or as a correction to an assertion that Geach is married to the woman with the scarf, for example. In these cases, *tie* or *with the tie* would count as contrastive focus constituents. But main sentence stress was also assumed to be present on *tie* when it is merely new in the discourse, as when (1) is a response to the question ‘What happened?’, or a sentence uttered out of the blue. An identity of prominence for contrastive focus and noncontrastive constituents is thus implied by this early examination of the focus-prosody relation.

Later approaches which saw the relation between focus and sentence prosody as a relation between contrastive focus and/or discourse-newness on the one hand and tonal pitch accents on the other (e.g. Gussenhoven 1983, Selkirk 1984, 1995, Schwarzschild 1999) contributed to the view that contrastive focus prominence is indistinguishable from the prominence of noncontrastive elements. In a sentence like (1) a pitch accent is present on *tie* whether it is a contrastive focus or simply new in the discourse.

But it turns out that the facts do not support the view that the grammar treats contrastive focus and noncontrastive constituents as systematically identical in their prominence. Indeed, a broad range of facts - some new, some

known - favor a theory which posits a representation for contrastive focus in the syntax that is distinct from that of noncontrastive constituents and with it a syntax-phonology interface principle that is specific to contrastive focus. A grammatical treatment of this kind is provided by the Rooth 1992, 1996a theory of the syntactic representation and semantic interpretation of contrastive focus together with what is dubbed here the Contrastive Focus Prominence Rule (CFPR). The CFPR is a principle for the phonological interpretation of contrastive focus, independently proposed by Truckenbrodt 1995 and Rooth 1996b.

(2) Contrastive Focus Prominence Rule (Truckenbrodt 1995, Rooth 1996b)

Within the scope of a focus interpretation operator, the corresponding F-marked [contrastive focus] constituent is the most metrically prominent.

The CFPR, completely simple in its formulation, makes a complex array of predictions about contrastive focus prosody which have not yet been examined in a sufficiently broad range of cases. And the data available suggests that the predictions of the CFPR are confirmed to a quite remarkable degree.

The CFPR predicts that the level of phrase stress found on an F-marked, contrastive focus constituent will be greater than that of any other constituent that is within the scope of the focus operator associated with the contrastive focus. This means that the level of a contrastive focus phrase stress is a function of the level of stress on the other elements within that scope. Since the level of phrase stress on those other elements may vary, for independent reasons, it is predicted that the level of the contrastive focus stress will vary accordingly. Indeed, in satisfaction of the CFPR a contrastive focus may bear the lowest possible level of phrase stress—just above the level of word stress—in one case, while it may bear the highest possible level of stress—intonational phrase-level

main stress—in another. An example of intonational phrase-level stress is provided by sentences containing both a contrastive focus and other discourse-new major phrase-stressed constituents within the same focus scope, as in (3) and (4), where the scope coincides with the VP³. The subscripting indicates the contrastive focus DP with which the focusing adverb *only* is associated.

- (3) Wittgenstein *only*_i [brought a glass of wine over to Ánscombe].
(I was surprised until I found out that Geach, who was standing with her, was on the wagon.)
- (4) Wittgenstein *only*_i [brought a glass of wine_i over to Ánscombe].
(She was impatient until the appetizers were brought around by waiters.)

Results of a phonetic experiment by Katz and Selkirk 2005/6 show that when the prosody of such sentences is compared with that of a noncontrastive all-new sentence like (5), the phonetic prominence of the contrastive focus (measured in terms of duration and pitch boost and noted here with underlining) is significantly greater than that of a noncontrastive constituent in the same position.

- (5) Wittgenstein brought a glásss of wine over to Ánscombe.

Since all the DPs of the sentences in (3-5) appear with major phrase-level stress, the distinctively greater prominence of contrastive focus must be represented with the higher-level intonational phrase prominence.

Contrastive focus may also bears the lowest possible degree of phrase stress; this is found with what has been referred to as second occurrence focus. In classic cases of second occurrence focus (SOF), there is a repetition in the

³ The fact that, when discourse-new, both the contrastive focus complement to the verb and the noncontrastive one bear pitch accents, as shown in (3) and (4), is sometimes overlooked, but cf. Katz and Selkirk 2005/6.

discourse of a construction containing a focus sensitive particle like *only* and the contrastive focus constituent with which it is associated, as in (6B) and (7B):

- (6) A: Wittgenstein only_i [brought a glásss of wíne over to Ánscombe_{Fi}].
 B: Also_k Géach_{Fk} only_i [brought a glass of wine over to Anscombe_{SOFi}].
- (7) A: Wittgenstein only_i [brought a glásss of wíne_{Fi} over to Ánscombe].
 B: Also_k Géach_{Fk} only_i [brought a glass of wine_{SOFi} over to Anscombe].

The A sentences introduce a particular contrastive focus construction. In the B sentences that construction appears in a second occurrence. In the SOF cases seen in (6B, 7B), the sentence contains an additional contrastive focus, call it the primary focus. (Though, as the examples to be examined below in (20) show, the presence of another, primary, contrastive focus is not a necessary property of SOF sentences.) It has been established that a SOF typically bears no pitch accent in sentences like those in (6B, 7B), where it appears following the primary focus. Yet, there is evidence that that SOF in that position does indeed bear some degree of phonetic prominence, even if not a pitch accent⁴. Beaver et al (2006), for example, show experimentally for English that there is greater phonetic duration and intensity on SOF constituents in sentences like those in (6B) or (7B)—indicated by the underlining—than on a given but noncontrastive constituent in an analogous sentence position, as in a sentence like (8B):

- (8) A: Wittgenstein brought a glass of wíne over to Ánscombe.
 B: Géach_i [brought a glass of wine over to Anscombe], too_i.

In the discourse in (8), there is no contrastive focus in the A sentence and thus no second occurrence focus in the B sentence. (By definition a second

⁴ Rooth 1996b, Bartels 1995, 2004, Beaver et al 2004/to appear, Féry and Ishihara 2005/to appear.

occurrence focus is a contrastive focus that has already been introduced in the discourse.) The elements of the VP in (8B) are simply given in the discourse. It's the CFPR that explains the greater phonetic duration found with the SOF constituents in sentences like (6B) and (7B) as contrasted to the analogous noncontrastive discourse-given constituent in (8B). The degree of phrase stress on SOF in these cases is the lowest attested; it is below the level of phrase stress at which a pitch accent appears. It needn't be any higher, since the other constituents in the same focus scope in (6B) and (7B) have only word-level stress, due to their given status (cf. Selkirk 2006b).

In between these extremes of stress, there are contexts in which the CFPR predicts a level of phrase stress on a contrastive focus that is the same as that predicted for noncontrastive constituents by the default phrase stress principles of the language. Such a neutralization of prominence on contrastive and noncontrastive constituents is predicted by the CFPR to be possible in a sentence with the structure of (1), for example, and doubtless has fed the erroneous assumption that there is no grammatically-driven distinction in prosody between contrastive and noncontrastive constituents in English. The cases of absence of neutralization of stress prominence level between contrastive focus and noncontrastive constituents mentioned above clearly are crucial in establishing that the grammar does distinguish a category of contrastive focus.

3 Distinguishing Contrastive Focus, Discourse-New and Discourse-Given

The second controversy addressed in this note concerns the syntactic marking for contrastive focus and for the property of discourse-newness and/or givenness. The data on the phonology of contrastive focus alluded to above suggests that there can't be a unitary F-marking in the syntax for both contrastive focus and a putative informational, discourse-new, focus, precisely

because the phonology relies on the syntactic representation to identify which are contrastive focus constituents and which not. F-marking should be restricted to contrastive focus, as has been the case in many works on focus, including Jackendoff 1972 and Rooth 1992 et seq. But discourse newness or givenness of constituents cannot go unmarked in the syntax. Both semantic/pragmatic interpretation and phonological interpretation rely on some indication in the syntax of the status of a constituent on the given-new dimension. Noncontrastive discourse-given constituents are distinguished in their prosody from noncontrastive discourse-new constituents in English. This is shown by the accentless status of given constituents in the response to the *wh*-question in (8). It is shown as well by the rendition of the sentence *Wittgenstein brought a glass of wine over to Anscombe* in (9), where a discourse-given constituent follows what is an otherwise all-new sequence of constituents which moreover contains no contrastive focus.

- (9) A: *Anscombe* has been feuding with her colleagues.
 B: Wittgenstein brought a glass of wine over to *Anscombe*. Perhaps they have made up.

In the B response to A, there is no pitch accent (or phrase stress) on *Anscombe*, which has been used in the previous sentence in the discourse. If a pitch accent were present on *Anscombe* in (9B), it would render the sentence pragmatically infelicitous—but not false—in this discourse⁵. This inability of a discourse-given constituent to bear a pitch accent or phrase stress in English, at least in certain contexts, has been widely observed.

So how are we to represent a difference between contrastive focus and discourse-new on the one hand, and between these and discourse-givenness on

⁵ Either that or the sentence would have to be interpreted as one where the speaker put a contrastive focus on *Anscombe*.

the other? As mentioned above, a unitary F-marking for contrastive focus and informational focus (assumed by Gussenhoven 1983, Selkirk 1984, 1995 and Schwarzschild 1999 among others) cannot be adopted. Such approaches do distinguish discourse-given constituents—by their absence of F-marking—but the predicted conflation of contrastive focus and discourse-newness in the phonology is not systematically attested. A three-way distinction between contrastive focus, discourse-new and discourse-given is needed. The question is how to represent it.

Early approaches to the intonation of given/new have all treated given constituents as unmarked in the syntax. A three-way distinction in the syntax which retained this unmarked status for given constituents could posit two different types of focus-marking, e.g. cF-marking for contrastive focus and iF-marking for informational focus⁶. But the evidence suggests instead that it is discourse-givenness that is marked in the syntax, and that discourse-newness should not be marked at all. Féry and Samek-Lodovici (2006) (hereafter FSL) propose that the grammar includes a constraint *Destress Given* which calls for absence of phrase stress on a discourse-given constituent.

(10) *Destress Given* (Féry and Samek-Lodovici 2006)

A given phrase is prosodically nonprominent.

In the syntax, they suggest, a discourse-given constituent is G-marked and thereby identifiable by *Destress Given*. As for discourse-newness, though FSL do not take a position on whether or not it is syntactically represented, they do

⁶ Selkirk 2002, 2006a and Selkirk and Kratzer (2004/2005) use the notation FOCUS (“big focus”) vs. F (“small focus”) to give syntactic representation to a contrastive focus vs. discourse newness focus. Katz and Selkirk (2005) use the notation cF vs. iF.

argue that the prosody of discourse-new constituents can be essentially derived by default phrase stress principles.

In this note, we propose adopting the three-way distinction in focus-marking implied in the FSL account: F-marking for contrastive focus, G-marking for discourse-given, and no marking for discourse-new. There is positive evidence for representing givenness with G-marking rather than no marking at all; the argument is based on the analysis of second occurrence focus. The extremely low degree of stress on second occurrence focus constituents in sentences like (6B) and (7B) can be understood to be simply the consequence of their G-marked status and the effect of Destress Given, while the fact that there is any degree of phrase stress at all on SOF (as compared to the other given elements that surround it) is understood to be the consequence of their F-marking and the CFPR. Without a grammatical representation of G-marking, such a simultaneous representation of both contrastive focus status and givenness in the case of second occurrence focus would not be possible.

4 G-Marking as Part of a Solution to the Problem of Second Occurrence Focus

The notion that there is a G-marking for given constituents and no marking for discourse-new constituents is consistent with the Schwarzschild (1999) theory of the semantics/pragmatics of the given-new dimension, which is a theory of the meaning of givenness. That theory can be reconstrued as providing an interpretation of G-marking rather than an interpretation of the absence of F-marking. The suggestion here, then, is that the Rooth theory of contrastive focus and the Schwarzschild theory of givenness co-exist in the grammar⁷.

⁷ This position was taken in joint class lectures by Angelika Kratzer and Lisa Selkirk (Selkirk and Kratzer 2004/2005).

An outstanding issue is the fact that, except in cases of second occurrence focus, contrastive focus constituents that are discourse-given are not destressed and instead bear the pitch-accenting and phrase stress of discourse-new contrastive focus. This is seen in example (11):

- (11) A: Ánscombe has been féuding with her cólleagueues.
B: Wítngenstein brought a glass of wíne over to Ánscombe. But nó to the óthers. Presúmably as an áct of reconciliátion.

Our proposal is that, except for second occurrence focus, contrastive focus constituents are never G-marked. This follows from a G-Marking Condition to be proposed here which crucially relies on the semantics of focus constituents proposed in Rooth (1992).

The current theory does not fully embrace the theory of givenness put forward by Schwarzschild (1999), which is designed to subsume all aspects of the interpretation of focus. The intent of the Schwarzschild givenness theory is to supplant theories of contrastive focus like that proposed by Rooth (1992, 1996) and provide a unified account of contrastive focus, informational focus, focus in questions and focus in answers. But as we have seen, alongside a phonology of givenness, we need a phonology of contrastive focus. There is a distinct phonology for contrastive focus which requires both contrastive focus marking and a representation of the scope of contrastive focus operators in the syntax. The proposal here is that there is a separate semantics for contrastive focus and for givenness as well, the first provided by Rooth (1992, 1996), the second by Schwarzschild (1999). An advantage of assuming that both these theories are part of the grammar is that the Rooth theory of contrastive focus semantics provides the means to properly characterize what aspects of meaning must be entailed by the prior discourse in order that a constituent count as G-marked. It enables us to understand why the phonology treats second occurrence

(contrastive) focus and noncontrastive discourse-given constituents as a natural class, specified by G-marking, but does not treat a non-SOF discourse-given contrastive focus as G-marked.

Rooth 1992, 1996 is a multidimensional theory of meaning according to which every expression γ has an ordinary semantic value $[[\gamma]]^o$ and a focus semantic value $[[\gamma]]^f$. Any type of constituent has an ordinary semantic value. A focus semantic value is defined for a phrase φ which contains an F-marked constituent and is the scope of the focus \sim operator corresponding to that F-marked constituent. We propose to make use of these two sorts of meaning in defining the circumstances under which a constituent may be G-marked.

Standard contrastive focus involves constituents which may or may not have antecedents in the discourse. In (12) the contrastive focus in the B sentence has no discourse-antecedent, but in (13), it does.

- (12) A: Mrs. Dalloway invited many people to the party.
 B: But she only [_{VP}[introduced Anabel to [William]_F]_{VP} \sim]
- (13) A: Mrs. Dalloway invited William and a group of his friends to her party.
 B: But she only [_{VP}[introduced Anabel to [William]_F]_{VP} \sim]

The phonology of both versions of the contrastive focus sentence is identical, with pitch accent and greatest prominence on the F-marked [William]_F (cf. Katz and Selkirk 2006). But, in view of its prior mention, why is [William]_F in (13B) not G-marked and destressed?

Consider the case of second occurrence focus in (14), where the SOF instance of William in (14B) lacks a pitch accent and is only marginally more prominent than the accentless discourse-given Anabel. A theory that treats the SOF as G-marked will allow an account of the difference between (13B) and (14b).

- (14) A: Mrs. Dalloway only [_{VP}[introduced Anabel to [William]_F] _{VP} ~]
 B: [Even [her husband]_F only [_{VP}[introduced Anabel to [William]_{SOF}] _{VP} ~] ~]

The alternatives set which constitutes the focus semantic value of the verb phrase scope of all these instances of contrastive focus in the B sentences might consist of the following:

- (15) {introduce Anabel to William, introduce Anabel to Charles, introduce Anabel to Margaret, introduce Anabel to Diana, introduce Anabel to Harry, etc.}

In the case of the discourse consisting of the sentences in (14), this alternatives set—this focus semantic value of the VP—is introduced by the contrastive focus operator in sentence (14A). This means that in (14B), the VP is discourse-given with respect to both its ordinary semantic value and with respect to its focus semantic value. The same is not true of the VP in (13B), where there is no discourse antecedent for either the ordinary semantic value or the focus semantic value of the VP. We suggest that this difference in the givenness of the focus semantic value for the phrasal scope that corresponds to an F-marked constituent, namely the givenness of the alternatives set which constitutes the focus semantic value, has consequences for defining the G-marked status of the F-marked constituent itself.

With this in mind we propose the following condition on G-marking:

(16) The G-Marking Condition

- (i) An F-marked constituent α will be G-marked iff the phrasal scope φ of the focus \sim operator corresponding to it has an antecedent in the discourse for its focus semantic value $[[\varphi]]_f$.

- (ii) Otherwise, a constituent α will be G-marked if it has an antecedent in the discourse for its ordinary semantic value $[[\alpha]]_o$.

The two different clauses for the G-Marking Condition amount to a proposal that givenness is defined differently for constituents that have only an ordinary semantic value from constituents that are F-marked and have both an ordinary and a focus semantic value. The intuition that clause (i) of the G-Marking Condition gives expression to is that a second occurrence contrastive focus is given *as a contrast* in the discourse. An F-marked constituent counts as given only with respect to the alternatives set—the focus semantic value—defined by the focus operator with which it is associated. According to (16), the givenness of the ordinary semantic value of an F-marked constituent is irrelevant. Only in the case of a non-F-marked constituent will G-marking be licensed based on the discourse-givenness of the ordinary semantic meaning of the constituent.

For the SOF sentence (14B), the G-Marking Condition predicts the G-marking seen in (17), in which the SOF *William* is both F-marked and G-marked:

- (17) [Even [her húsband]_F only [_φ[introduced_G Anabel_G to [William]_{F,G}]_φ ~] ~]

William, is F-marked, as is any element in association with *only*. It is G-marked too, in accordance with (16i), because the focus semantic value of the VP of the sentence, which is the phrasal scope of the \sim operator corresponding to [*William*]_F, has an antecedent in the discourse. The relevant focus semantic value of the VP in (17)/(14B) is the alternatives set in (15), and this has already been introduced in the discourse as the focus semantic value of the same VP in (14A), which is also the phrasal scope of the \sim operator.

By contrast, the G-Marking Condition predicts no G-marking in the representation of the contrastive focus *William* in (13B), even though its

ordinary semantic meaning has a discourse antecedent in sentence (13A). The representation of (13B) would be (18):

(18) But she only [_{VP} [introduced *Ánabel* to [*William*]_F]_φ ~]

In (18)/(13B), the F-marked constituent *William* is part of a newly established contrast; there is no antecedent for the alternatives set defined by its ~ operator. By clause (i) of the G-Marking Condition, the F-marked constituent [*William*]_F can therefore not be G-marked. So it will not undergo Destress Given, and will emerge with the same contrastive focus prominence as any entirely discourse-new standard contrastive focus, as in (12B). A standard, non-second-occurrence, contrastive focus will never qualify as given, on this theory, and will never have the prosody of a discourse-given entity.

To sum up, the proposed G-marking condition in (16) makes possible the cross-classification of focus features in syntactic representation shown in (19):

(19)	Standard contrastive focus:	F-marked
	Second occurrence contrastive focus:	F-marked, G-marked
	Given, non-contrastive:	G-marked
	Non-given, non-contrastive: (‘informational focus’)	-----

These feature combinations are seen by the spellout principles for F-marking (CFPR) and G-marking (Destress-Given), and together with the default stress principles⁸, and an appropriate ranking amongst all the constraints, give precisely the patterns of prominence required. The case of erstwhile informational focus, the last one listed, is different in that no spellout principle directly affects its phonological interpretation. Its phonological behavior is

⁸ Selkirk 2006bc, Selkirk and Kratzer 2006

predicted by its lack of focus features, as is its semantic/pragmatic interpretation.

That the puzzle of second occurrence focus should be solved by invoking the givenness of the focus semantic value in the case of SOF is already anticipated by Rooth (1996b). Rooth speculates that an appeal to the antecedent for the focus semantic value should be built into the CFPR, thereby restricting the CFPR to cases of SOF. This is the wrong move, since the CFPR is entirely general, applying in all cases of contrastive focus, as we have seen above. Büring 2006, for his part, denies that givenness has anything to do with the distinctive prosody of SOF. He seeks to derive it entirely from the general formulation of the CFPR that has been assumed in this paper, given in (2). For Büring what's special about SOF and what distinguishes it from other instances of contrastive focus is its (putative) defining status as the unique instance of focus embedded within the domain of another focus⁹. In such a case, by the CFPR, there would be less stress prominence on the SOF than on the focus with the higher domain, but greater prominence on the SOF than anything else in the focus domain of the SOF. From this lesser stress prominence, Büring proposes, the characteristic patterns of pitch accenting of SOF would follow. At issue here is the question of whether the lesser stress prominence of SOF can indeed be ascribed simply to the CFPR¹⁰. Is the focus domain of the SOF always embedded in the domain of some yet higher focus? It seems not.

The understanding of the prosody of SOF in the literature, and of what it implies for theories of focus representation, has been clouded by the assumption,

⁹ At this point in the exposition I am using the simple term 'focus' to refer to 'contrastive focus' as defined in the second paragraph of this paper, as involving Roothian alternatives. This should not be confused with the use of the term 'focus' to indicated newness in the discourse, a use which this paper argues should not be made.

¹⁰ That an appropriate representation of the stress prominence of SOF can account for its pitch accenting properties is not in dispute (see Selkirk 2006b).

implicit or otherwise, that instances of SOF occur in the first place only when embedded within the scope of some higher focus, as in the examples of (6B, 7B, 14B). But this is simply an oversight. Cases of SOF also occur in sentences that lack further instances of (contrastive) focus, as the B sentences in (20) show. Moreover, a full understanding of the grammar of SOF also requires us to compare the prosody of SOF constituents with that of discourse-given constituents which are not F-marked at all, like those seen in the C examples below.

- (20) a. A: Only [Eleanor]_F was introduced to Franklin by his mother.
 B: And his whole life, he loved only [Eleanor]_{F,G}.
 C: And his whole life, he loved [Eleanor]_G.
- b. A: The New York Times gives only [newspaper subscriptions]_F to the city's poor.
 B: I don't think they can live on only [newspaper subscriptions]_{F,G}.
 C: I don't think they can live on [newspaper subscriptions]_G.
- c. A: We were ordered to only think [good thoughts]_F.
 B: But we were bored by only thinking [good thoughts]_{F,G}.
 C: But we were bored by only thinking [good thoughts]_G.

As the B examples show, there is an absence of pitch accent on the SOF in the cases where it follows another stress/pitch accent in the sentence. This is the pattern widely observed (see discussion of (6B, 7B)). The generalization that emerges on the basis of the facts in (20) is that the stress/pitch accenting patterns of SOF depend in no way on the embeddedness of the focus domain of SOF within a higher focus domain. SOF that are *not* nested within the domain of another (contrastive) focus, like these in (20), have the same stress/pitch accenting patterns as SOF that *are* in nested-focus domain contexts, like those in

(6B), (7B) and (14B)/(17)¹¹. More telling still, the pitch accenting of a SOF constituent is identical to that of a discourse-given constituent that is *not* F-marked, as the comparison of the B and C sentences in (20) shows. These generalizations would have to be regarded as accidental by a theory which held that the prosody of SOF derives from its presence in an embedded focus domain. But they follow from a theory which derives the prosody of a SOF constituent from its discourse-given, G-marked status.

5 Summary

In summary, this note has argued for a three way distinction in the syntactic marking of “focus” and its phonological and semantic interpretation. Only contrastive (alternatives) focus (Rooth 1992, 1996) is given an F-marking in the syntax, and this is interpreted by both the phonology and the semantics. In addition, a G-marking is posited here for both discourse-given constituents and second occurrence focus constituents; it is phonologically interpreted as proposed by Féry and Samek-Lodovici 2006. These two cases of G-marking fall out from the G-Marking Condition proposed here (and in Selkirk 2006b), which relies on elements of both the alternatives semantics of Rooth 1992 and the Schwarzschild (1999) theory of givenness. Discourse-new constituents are not marked in the syntax; they are not considered to be a species of focus; they are not F-marked. Their semantics is accordingly predicted to be ‘neutral’, and their prosody is as well, the latter being produced by default principles of phrase stress (cf. Selkirk 2006b, Selkirk and Kratzer 2006).

¹¹ Büring 2006 assumes that the focus domain for the primary focus to the left of the SOF in the cases like (6B), (7B) and (17) is the entire sentence and hence that the SOF focus domain is embedded within it.

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Contrastive Focus

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The article puts forward a discourse-pragmatic approach to the notoriously evasive phenomena of contrastivity and emphasis. It is argued that occurrences of focus that are treated in terms of ‘contrastive focus’, ‘kontrast’ (Vallduví & Vilkuna 1998) or ‘identificational focus’ (É. Kiss 1998) in the literature, should not be analyzed in familiar semantic terms like introduction of alternatives or exhaustivity. Rather, an adequate analysis must take into account discourse-pragmatic notions like *hearer expectation* or *discourse expectability* of the focused content in a given discourse situation. The less expected a given content is judged to be for the hearer, relative to the Common Ground, the more likely a speaker is to mark this content by means of special grammatical devices, giving rise to emphasis.

Keywords: contrastive focus, emphasis, discourse expectability

1 Introduction

According to Tomioka (2006), the notion of contrastivity is connected to diverse linguistic phenomena, such as e.g., exhaustive answers in question-answer pairs (cf. 1a), contrastive statements (cf. 1b), or instances of corrective focus (cf. 1c):

- (1) a. Q: Who did you invite?
A: Paul, I invited (but nobody else).
- b. I did not invite Peter, but Paul.
- c. A: You invited Peter?
B: No, I invited Paul.

While all the contrastive elements in (1) form instances of contrastive focus in an intuitive sense, there is considerable disagreement concerning the correct

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analysis of contrastive focus in intonation languages: The central questions are the following: Does *contrastive focus* constitute an IS-category of its own, independent of the more basic notion of focus as evoking a set of contextually salient alternatives (Rooth 1985, 1992)? And if so, are there any reliable pragmatic and/or prosodic clues for its identification? Prosodic evidence from intonation languages suggests that contrastive focus is not fully independent from focus, as contrastive foci differ only gradually in intonation from information foci (see Hartmann, t.a., and references therein). In contrast, evidence from languages such as Hungarian or Finnish, in which ‘contrastive’ elements are realized in a particular syntactic position, suggests the opposite (É. Kiss 1998, Vallduví & Vilkuna 1998). This raises the question of what constitutes the set of characteristic semantic or pragmatic features of contrastive foci in these languages. A prominent line of research argues that contrastive foci are characterized on the base of semantic features, such as exhaustiveness, and can therefore be diagnosed by looking at genuine semantic phenomena, such as the logical relations between sentence pairs (Szabolsci 1981, É. Kiss 1998).

The present article argues that contrastivity is best approached as a discourse-pragmatic phenomenon with grammatical reflexes, perhaps exempting Hungarian: Contrastivity in this sense means that a particular content, or a particular speech act is unexpected for the hearer from the speaker’s perspective. One way for the speaker to raise the hearer’s attention, and to get him to shift his background assumptions accordingly, is to use additional grammatical marking, e.g. intonation contour, syntactic movement, clefts, or morphological markers. This special marking seems to correlate to what is often called *emphatic* marking in descriptive and typological accounts of non-european languages. Contrastivity defined in this way depends on the speakers assumptions about what the hearer considers to be likely or unlikely, introducing a certain degree of subjectivity. It follows that models for diagnosing contrastive foci must be more

elaborate, containing not only information on the state of the linguistic and non-linguistic context as such, but also on the background assumptions of speaker and hearer, respectively.

2 Four Observations

Let us start with four observations, mostly from West Chadic: First, Hausa and Bole (West Chadic) show a clear tendency for leaving information focus on non-subjects unmarked, whereas a formal marking of non-subject foci (Hausa: movement, Bole: morphological marker) correlates with contrastive uses as illustrated in (1), cf. (2) from Bole:

- (2) Q: What did Lengi do?
 A: *Léngì kàpp-ák (yé) mòrdǒ.*
 Lengi plant-PERF.F.AGR FOC millet
 - yé: ‘Lengi planted MILLET.’
 + yé: ‘It was millet that L. planted!’

The formal marking of information focus and contrastive focus in these languages thus differs not only gradually, but categorically: The notion of contrast has a real impact on the grammatical system (Hartmann, t.a.).

Second, Gùrùntùm uniformly marks all kinds of foci by means of the focus marker *a*, typically preceding the focus constituent (Hartmann & Zimmermann 2006). However, non-subject foci can additionally be highlighted by fronting them to sentence-initial position, using a cleft-like relative structure:

- (3) Q: What did Audu catch?
 A: [*Á gàmshí*] *mài Áudù náa.*
 FOC crocodile REL Audu catch
 ‘Audu caught A CROCODILE.’

The continued presence of the focus marker *a* on the moved constituent suggests that contrastive foci are just special kinds of foci. This conclusion squares up with the fact that information and contrastive focus differ only gradually in intonation languages.

Third, a number of languages that allow for movement to the left periphery (e.g. Hausa, German), exhibit the phenomenon of partial focus movement (Hartmann & Zimmermann, in press). Only the most relevant part of the focus constituent moves, cf. (4) from Hausa [HB 4.03]:

- (4) A: What happened?
 Q: B'àràayii nèe su-kà yi mîn saatàa!
 [S-focus] robbersprt 3pl-rel.perfdoto.me theft
 'Robbers have stolen from me!'

This suggests that movement of (part of) the focus constituent is not so much triggered by its focus status per se, but by additional semantic or discourse-pragmatic considerations.

Fourth, and most important, there is no absolute correspondence between a certain focus use (information, corrective, selective etc.) and its being grammatically marked, or emphasized, in languages as diverse as Finnish and Hausa (Molnár & Järventausta 2003, Hartmann & Zimmermann, in press). While information foci in answers to *wh*-questions are typically *unmarked*, they can sometimes be marked as well. And while corrective foci in corrections are typically *marked*, they can sometimes go unmarked as well, cf. (5) [HB 3.03]:

- (5) A: You will pay 20 Naira.
 B: A'a, zâ-n biyaa *shâ biyaĩr* nèe.
 nofut-1sg pay fifteen PRT
 'No, I will pay fifteen.'

It is therefore impossible to predict the presence or absence of a contrastive marking on a focus constituent α just on the base of its inherent properties, or its immediate discourse function (answer, correction). Rather, the presence or absence of a special grammatical marking on α depends on specific discourse requirements at a specific point in the discourse. These are influenced by the intentions of the speaker and her assumptions about the knowledge states of the hearer(s). It follows that a wider range of pragmatic factors pertaining to such knowledge states, and to particular discourse goals must be considered in analyzing contrastivity. A promising formal account of relevant pragmatic factors is found in Steedman's (2006) analysis of German and English.

3 Towards a Formalization: Steedman (2006) on Intonational Meaning

The main purpose of this rough sketch of Steedman's system is to demonstrate that it is possible, in principle, to develop a formally precise analysis of discourse phenomena such as the ones considered here. Steedman's (2006) main point is that pitch accents and boundary tones in German and English serve to mark more IS- and discourse-related distinctions than just the *theme-rheme* contrast, where *theme* and *rheme* are not understood as *given* and *new*, or as *background* and *kontrast* (Vallduví & Vilkuna 1998), but as *context-dependent* and *context-independent* (Bolinger 1965), respectively, cf. (6). In many cases, the *rheme* of an utterance corresponds to the notion of focus as used in this article. The pitch accents themselves indicate the existence of a contextually salient set of alternatives (Bolinger 1961, Rooth 1992).

Besides the theme-rheme distinction, pitch accents and boundary tones are taken to express information at a separate level of *discourse structure*: The kind of pitch accent chosen indicates whether an information unit is *common ground* (H* family) or not (L*family). Different boundary tones mark an information

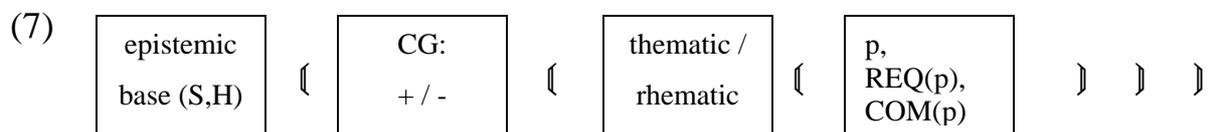
unit as *speaker's supposition* (L% family) or as *hearer's supposition* (H% family). Different tones thus convey information concerning the status of an information unit (theme or rheme) as being in the common ground or not, and concerning the epistemic attitudes of speaker/hearer relative to this information. Without going into too much detail, the following examples will help to get a preliminary idea of the discourse-semantic effects of L%/H% boundary tones and L*/H* pitch accents on the on otherwise identical clauses:

- (6) a. You put my TROUSERS in the MICROWAVE! (\rightarrow *You did that.*)
 H* H* LL%
- b. You put my TROUSERS in the MICROWAVE? (\rightarrow *I don't believe it !*)
 L* L* LL%
- c. You put my TROUSERS in the MICROWAVE? (\rightarrow *You really did that ?*)
 H* H* LH%

The falling declarative statement (6a) expresses the speaker's contention that the hearer's ill-treatment of her trousers should be known or acceptable to both discourse participants, and thus be part of the common ground. The all-low declarative (6b), on the other hand, expresses the speakers unwillingness to accept the content of (6b) as part of the common ground, thus expressing an element of disbelief. The rising declarative question (6c), finally, indicates that the hearer can safely assume the proposition expressed to be entertained by both him and the speaker, as the speaker has reason to believe that this is indeed the case, cf. also Gunlogson (2003) for related ideas.

What is important is that the coding of differences in the suppositions of speaker and hearer about the common ground serves an important discourse-structural function: It sets the scene for sub-sequent discourse moves aimed at smoothing out the assumed differences, e.g. additional explanation on the part of

the speaker, or accommodation on the part of the hearer. Notice that entire utterances can be rhematic, corresponding to wide focus on the sentence. In addition, not only (asserted) propositions, or parts of propositions, but also speech acts, such as requests (REQ) and commands (COM), can be qualified as parts (or non-parts) of the common ground relative to the speaker's or hearer's knowledge base. Depending on the chosen intonation, these will be interpreted as more or less polite by the hearer. The hierarchical organization of the various layers of information expressed by intonation is schematized in (7):



Summing up, Steedman's system provides a formal account of the meaning contribution of tones in intonation languages. These are used to express information at the two levels of information structure (IS) and discourse structure (DS): (i.) They distinguish themes from rhemes (IS); (ii.) they indicate whether the themes or rhemes are common ground (DS); (iii.) they indicate the epistemic base for this evaluation (DS). What the proposed system cannot do, though, is to account for contrastivity effects as illustrated in (1), which – in intonation languages – arise in connection with a more articulated pitch contour (higher target, steeper increase) or with fronting, as in scrambling or topicalization (Frey 2004).¹

¹ Contrary to what is assumed here, Steedman (2006) does not take contrastivity to single out a specific sub-class of rhemes or foci. For him (2006: 8), *contrastive focus* is the same as *kontrast* (Vallduví & Vilkuna 1998). It is triggered by any occurrence of pitch accent, indicating the existence of a contextually salient set of alternatives. This is the very function typically attributed to *focus* in Rooth's *Alternative Semantics*.

4 Extending the Analysis: Semantic Effects of Contrastive Focus Marking

Taking Steedman's framework as the base for exploring into the nature of contrastive focus, let us assume that contrastive foci are used to convey information concerning the hearer's suppositions about the common ground, i.e. information at the level of discourse-structure. The semantic import of contrastive focus marking is stated in (8):

(8) *Contrastive Focus Hypothesis:*

Contrastive marking on a focus constituent α expresses the speaker's assumption that the hearer *will not consider* the content of α , or the speech act containing α *likely to be(come) common ground*.

Contrary to what is often assumed in the literature, contrastive foci thus do not mark a contrast between explicit or implicit alternatives to α in the linguistic context.² Rather, they express a contrast between the information conveyed by the speaker in asserting α and the assumed expectation state of the hearer: A speaker will use contrastive marking on a focus constituent α if he has reason to suspect that the hearer will be surprised by the assertion of α , or by the speech act containing α . Because of this, the speaker uses a non-canonical, i.e. marked grammatical form to raise the hearer's attention, and to shift his common ground in accordance with the new information provided. This is best shown by looking at the typical and atypical patterns observed with contrastive focus marking towards the end of section 2.

² This discourse-oriented use of the term *contrastive* differs radically from the one found in Buring's (1997) analysis of *contrastive topics*. Buring's notion of contrastivity is semantically much weaker, simply indicating the presence of alternatives in form of alternative sub-questions that have not yet been answered.

4.1 Contrastive focus marking: typical patterns

Contrastive focus marking is typically absent in answers to *wh*-questions, cf. (9a), and typically present in correcting statements, cf. (9b):

- (9) a. Q: What did you eat in Russia? A: We ate *pelmeni*.
- b. A: Surely, you ate *pelmeni*!
 B: No, *caviar*, we ate! /
 No, we ate ↑*caviar*! (↑= raised pitch)

The absence of contrastive focus marking in (9a) is predicted by (8): The most likely speech act following on a *wh*-question is an answer providing the required information. The speaker can also assume that the hearer will not be surprised by the choice of *pelmeni* as her common staple in Russia, and therefore will have no problems with updating the common ground accordingly. Hence, no need for contrastive marking. In (9b), in contrast, it follows from hearer A's assertion that she does not expect to be contradicted. Also, speaker B can assume that the hearer will not consider *caviar* a very likely food to be had (even in Russia), and she expresses this accordingly by using a contrastive focus.

4.2 Contrastive focus marking: atypical patterns

Atypical patterns are observed in connection with the presence of contrastive marking on focus constituents in answers to *wh*-questions, cf. (10), and with the absence of contrastive marking on corrective foci, cf. (5):

- (10) Q: What did you eat in Russia?
 A: *Caviar* we ate / We ate ↑*caviar* !

Even though an answer is expected in (10), the informational content of the focus constituent *caviar* is judged to be so unexpected by the speaker to warrant a special contrastive marking on it. In the bargaining situation in (5), on the

other hand, the situation is conventionalized such that the hearer can safely assume that the speaker will not be surprised by his rejecting the original price, nor by his offering a lower price. Hence, no need for contrastive marking.

There are other reasons for using contrastive focus marking in answers to *wh*-questions so as to explicitly reject a likely expectation on the side of the hearer. E.g., contrastive marking can be used to reject the assumption that more than one individual will satisfy the predicate in the question, cf. (11):

- (11) Who (all) did you invite?
Peter, I invited, (but nobody else).

The exhaustiveness implied by the contrastively marked answer in (11) is often taken to be a characteristic property of contrastive foci in general (É. Kiss 1998, Vallduví & Vilkuna 1998), whereas here it comes out as a special subcase of the more general case in (8). Notice that this is a desired outcome, for in practice it often proves difficult to demonstrate that a contrastively focused constituent has an exhaustive interpretation, the reason for this being that not all contrastive foci give rise to implicatures of exhaustiveness.

Notice incidentally that many languages have lexicalized at least some of the meaning facets of contrastive focus, or its implicatures, in form of focus-sensitive particles, such as *only*, expressing exhaustiveness, or *even*, expressing the relative unlikelihood of the asserted proposition compared to the focus alternatives ordered on a scale (Karttunen & Peters 1979). This nicely squares up with the observation that such focus particles show a tendency to occur with contrastive foci as well (Tomioka 2006): Both devices have the same semantic effect on the hearer.³

³ The parallel between contrastive focus and the focus particle *even* might eventually pave the way to a further generalization of the meaning of contrastive focus. It has been argued that the presence of *even* not necessarily indicates the relative unlikelihood of a

Finally, it is also possible to mark only part of the focus for contrastivity, giving rise to partial movement, cf. (4). Here, only part of the focus is taken to be unexpected for the hearer, and hence in need of contrastive marking.

5 Typological Implications: Intonation and Tone Languages

As shown, both intonation languages and Chadic tone languages can and do express contrastivity in their respective grammars. The grammatical systems of the two language groups differ in another respect, though, with drastic effects on the perspicuity of contrastive foci in the two groups. Intonation languages obligatorily mark the existence of a contextually salient set of alternatives, i.e. focus, by using a pitch accent. As a result, every focus, contrastive or not, carries a pitch accent, often blurring the distinction between the two. The West Chadic languages, in contrast, need not grammatically mark the existence of alternatives, i.e. focus, on non-subjects (see Hartmann & Zimmermann, in press, on the restriction to non-subjects): Focused non-subjects are only marked when contrastive, which makes contrastive focus relatively easy to identify in these languages. This difference in identifiability aside, both groups of languages have comparable grammatical means, i.e. contrastive focus marking, in order to achieve the same discursive end, namely discourse maintenance by ensuring a smooth update of the common ground in situations of (assumed) differences in the assumptions of speaker and hearer. Given that the latter process can be taken to form an integral part of any inter-human conversation, the universal availability of contrastive focus marking, or emphasis, is not surprising.

proposition, but simply the presence of a scale in need of an ordering source (Kay 1990). In most cases, the ordering source for the scale will be a measure of (un)likelihood, but in certain cases it can also be assigned a special ordering source by the context. Extending this analysis to contrastive foci, one could argue that these, too, merely indicate the presence of a scalar ordering with the measure of (un)likelihood as its default value.

6 Conclusion

Contrastive focus marking does not so much indicate the explicit or implicit presence of contrasting alternatives in the linguistic context, although this may be a side effect, but rather a contrast between the information conveyed by the speaker in asserting α and the assumed expectation state of the hearer: The speaker marks the content of α as – in her view – unlikely to be expected by the hearer, thus preparing the scene for a swifter update of the common ground. The introduction of a measure of (assumed) unlikelihood adds a moment of subjectivity to the notion of contrastivity. In diagnosing contrastivity, it will therefore not do to just look at isolated sentence pairs and the logical relations between them. Rather, it is necessary – in corpus studies – to search elaborate corpora containing information on the knowledge states of the discourse participants as well, and – in elicitation – to work with more elaborate models that specify such knowledge states.

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The Fallacy of Invariant Phonological Correlates of Information Structural Notions

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This paper claims that there is no phonological focus, topic, contrast, or, for that matter, phonological ‘new’, ‘given’ or ‘backgrounded’ elements. In other words, the phonology is unable to define information structure. It is a common fallacy that information structural categories are expressed by invariant grammatical correlates, be it syntactic, morphological or phonological ones. The truth is that phonological and phonetic cues *help* speaker and hearer to sort out which elements in a sentence express ‘newness’, ‘givenness’, ‘topic’ and ‘focus’, and only in this sense, phrasing and accent structure (pitch accents and deaccenting) are important phonological correlates of information structure. Languages display variations as to the role of phonology to enhance categories of information structure, and this variation reflects what is found in the ‘normal’ syntax and phonology of languages.

Keywords: Phonology, Interface with semantics and syntax

1 Introduction

A series of definitions of the information structural notions as mental states and as grammatical entities are introduced in section 2, and the remaining of the paper investigates the role of phonology for information structure. The query is well-motivated since in many languages, foci and topics are accompanied by phonological changes. First, foci and topics have been identified with sentence-initial, pre-verbal or post-verbal positions in the sentence, a property which can be located at the interface between syntax and phonology (section 3). Topics and foci are sometimes considered the bearers of special accents, for instance falling for focus and rising for topic (section 4). Alternatively and more simply, they

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are identified as the accented parts of the sentence (section 5). Following Schwarzschild's (1999) proposal, it could also be that deaccenting is the most relevant phonological correlate of information structure, signaling givenness (section 6). And, in some analyses, foci and topics trigger an obligatory special phrasing, which requires a prosodic phrase (p-phrase) boundary to their left or to their right (section 7). A given constituent, by contrast, is obligatorily dislocated.

We will see in the following pages, however, that neither topics nor foci can be defined in purely phonological or phonetic terms, but that the properties just listed are grammatical correlates helping to highlight or to background constituents, and arising from purely syntactic or independent phonological features of the language. These phonological correlates improve speech processing in general, but are not necessarily associated with information structure. All phonological features accompanying focus or topics also have roles which have nothing to do with information structure, and inversely, a topic or a focus can be left unrealized in the phonology. I assume without discussing this point of view in detail that syntactic correlates of information structural notions are to be analyzed in the same way: word order, cleft formation, dislocation, focus movement cannot be definitional for notions such as topic and focus, but that they can be helpful in assigning a particular information structural role to a constituent.

2 Definitions

Following Kuno (1972), Prince (1981), Lambrecht (1994) and many others, the notions of information structure (IS) have an ambivalent meaning. They denote extralinguistic cognitive or mental states of referents, actions, locations, temporality, but also the formal and communicative aspects of language, thus the way these concepts are implemented in grammar. Chafe (1976) speaks about

‘information packaging’ and considers hypotheses about the receiver’s assumptions as crucial to discourse structure. These are hypotheses about the status of the referent of each linguistic expression, as represented in the mind of the receiver at the moment of utterance. In other words, it is the way the information is transmitted that is crucial, rather than the lexical or propositional content of a sentence, around which grammar usually centers. Prince (1981) defines information structure (packaging of information) in the following way:

‘The tailoring of an utterance by a sender to meet the particular assumed needs of the intended receiver. That is, information packaging in natural language reflects the sender’s hypotheses about the receiver’s assumptions and beliefs and strategies.’

The notion of Common Ground, introduced by Stalnacker (1974) has been central in many subsequent theories of information structure, as it shapes the background to which new information is added. The Common Ground is the knowledge which the speaker assumes to be shared by herself and her interlocutor.

For Clark & Haviland (1977), *given* is ‘information [the speaker] believes the listener already knows and accepts as true’, and *new* is ‘information [the speaker] believes the listener does not yet know.’

As regards the implementation of the concepts of information structure in grammar, I do not aim at an exhaustive listing of information structural categories in this short paper for lack of space and because it is not the main aim of this paper, and refer instead the reader to the introduction of this volume and to Krifka’s paper which concentrates on the semantic aspects of information structure. A ‘topic’ is analyzed there and here as a referent which the remainder of the sentence is about, possibly contrasting with other referents under dispute,

and crucially followed by a focus constituent. The topic has often been previously introduced into the discourse, but does not have to. In other words, the notions of ‘topic’ and ‘given’ are to be kept apart. Topics can be contrastive, in which case they include a focused constituent, they can be aboutness topics, frame-setting topics, contrastive or familiarity topics.

‘Givenness’ has been attributed a formal status by Schwarzschild (1999) who claims that a given constituent is one which is entailed by the preceding discourse. This use of givenness is of course restricted to text-givenness (previously mentioned in the discourse), as opposed to context-givenness (contextually salient).

A focus can be wide or narrow, it can be ‘out of the blue’, informational, contrastive, selective or corrective, etc. In an all-new sentence, every constituent is (or is intended to be) equally new and important. A wide or narrow focus is understood here in the sense of Rooth (1985, 1992). Beside the normal semantic value present in each expression, a ‘focus semantic value’ is a facultative additional value, understood as a set of alternatives, that is a set of propositions which potentially contrast with the ordinary semantic value. The ordinary semantic value is always contained in this set.

Summing up, a distinction must be made between the status of referents as mental states, which can be new (inactive at the point of their introduction into the discourse) or given (active), and the linguistic means which serve to distinguish between focused elements (designated expression in a set of alternatives), topicalized elements (serving as the main referent for the remainder of the sentence) and backgrounded elements (anaphoric or phonetically repeated expressions). As a tendency, we expect new elements to be marked with indicators of focus and given/backgrounded ones to be marked in the grammar as topics or as unaccented elements, though this mapping is violated in many cases.

3 Focus and Topics as Positions in the Sentence

It is conspicuous that topics are usually sentence-initial constituents. Halliday (1967), for instance, claims that the initial position is a necessary condition of a ‘theme’ (a topic). A topicalized element is often realized as a separate i-phrase (intonation phrase), see Féry (2006) for a prosodic explanation of topic fronting, and Féry (2007) for a prosodic account of focus fronting. But in fact, initiality does not seem to be obligatory and languages may place their topics in other positions, as well. In the following Japanese sentence (1), the topic *dezaato-wa* ‘desert’ is placed after a quantifier, and it is thus not initial.¹ A subscripted P shows a prosodic phrase (p-phrase), and a subscripted I an intonation phrase (i-phrase).

- (1) ((Daremo-ga)_P (dezaato-wa)_P (aisu-o tabeta)_P)_I (Japanese)
 everyone-NOM desert-TOP ice-cream-ACC ate.
 ‘As for dessert, everyone ate ice-cream.’

At best, a clear preference for placing topics at the beginning of a sentence can be observed, and the reason for this is neither phonological nor syntactic. If the speaker wants to establish a frame for the rest of the sentence or if an aboutness topic is needed, (see Jacobs 2001), an early introduction of the topic is well-motivated for the sake of communication, as well as the placement of the comment afterwards (leading to the topic-comment structure of categorical sentences). A parallelism can be drawn with novels, like those of Jules Verne, or Honoré de Balzac, in which the narration begins after the characters have been described in detail.²

If, as in (2), an element is given, or expresses an afterthought, it is preferable to dislocate it from the main clause, which typically contains the focused

¹ Thanks to Shin Ishihara for his help with Japanese.

² Thanks to Serge Pahaut for attracting my attention to this similarity.

information, and to place it in a position where prominence is poorest. A final dislocated element is deaccented and possesses no phonological prominence. This is illustrated with ‘anti-topics’ in Cantonese (2a) and French (2b).³

- (2) a. ((Go loupo)_P (nei gin-gwo gaa)_P, (ni go namjan ge)_I). (Cantonese)
 CLF wife 2.SG see-EXP PTC this CLF man MDF
 ‘The wife you have seen, of this man.’
- b. ((Pierre l’a mangée)_P, (la pomme)_I). (French)
 Peter it-ACC has eaten, the apple
 ‘Peter has eaten the apple’

Focus has also been associated with special focus positions in certain languages. Hungarian is described as a language which obligatorily places an exhaustive focus preverbally (É.Kiss 1998), while Italian has been analyzed as a language with clause-initial (Rizzi 1997) or clause-final (Samek-Lodovici 2005) foci. Aghem has been analyzed as a language with a post-verbal focus position called IAV for ‘immediately after the verb’ (see Horvath 1986 and Aboh 2006 for this strong claim). It is to be noticed that ‘dedicated’ focus positions are sometimes defined structurally or linearly, but that in-depth analyses seem to prefer a linear definition (see Hyman & Polinsky 2006 for Aghem).

An alternative explanation, which accounts for the Hungarian facts without forcing an association between focus and pre-verbal position, can be stated in the following way. Hungarian is a left-headed language, both at the level of the p-word and at the level of the p-phrase. Focus wants to be prominent and the preferred stress position is at the beginning of the main i-phrase, directly after the topic which forms an independent i-phrase. This position is occupied by the narrow focus, as often as possible, and happens to be the verb in all other cases (see Szendrői 2003 who gives a syntactico-phonological account of the

³ See also Frey (2004) who finds contrastive topics in the middle field in German.

information structural facts of Hungarian). But focus may also be located somewhere else. In (3), adapted from É. Kiss and Szendrői, both the VP and *Mary* are focused and *Peter* is given, but the indirect object, which carries a narrow focus embedded in the VP (my analysis), is post-verbal. Small caps indicate stress.

- (3) ((Tegnap este)_P)_I ((BEMUTATTAM Pétert)_P MARINAK)_P)_I
 yesterday evening PRT-introduced-I Peter-ACC Mary-DAT
 ‘Yesterday evening, I introduced Peter to Mary.’ (Hungarian)

In Italian, as in other Romance languages, given elements are moved away from the matrix clause, and, in many cases, it is this necessary evacuation which causes finality of focus, see (4), adapted from Samek-Lodovici (2005). In other cases, though, a narrow focus finds itself in the postverbal position, even if it is not its canonical position. Italian is a language with final stress, both at the level of the p-word and at the level of the p-phrase, and syntactic reorganization helps prosody in moving narrow foci to the rightward position, as far as possible.

- (4) ((L’ho incontrato a PARIGI)_P, (Luigi)_P (ieri)_P)_I (Italian)
 (I) him have-met in Paris, Luigi, yesterday
 ‘I met Luigi in Paris yesterday.’

As for Aghem, Hyman & Polinsky (2006) claim that the IAV position is not reserved for focus, and that focus is not necessarily in the IAV position. In their analysis, some constituents appear obligatorily in this position independently from their focused or non-focused status. The preference for this position is explained independently by binding facts.

In sum, topics and foci may preferably occupy special positions in which general properties of the language allow them to carry prominence. But this is always a tendency which optimizes communication, and may arise from

independent grammatical components, like accent position preferences, binding and scope relationships.

4 Bearers of Special Accents

Bolinger (1958) introduced a distinction between accent A, a falling accent, and accent B, a fall-rise accent, and Jackendoff (1972) and Liberman & Pierrehumbert (1984) related the former to focus and the latter to topic, as in (5). *Manny* has accent B, and *Anna* accent A.

- (5) {What about Manny? Who did he come with?}
 ((Manny)_P (came with Anna)_P)_I (English)

Büring (2003) for German, and Steedman (2000) for English establish an obligatory relationship between contours and roles in letting pitch accent contours participate to the definition of topics and foci. Other attempts to relate forms of accents to specific information structural roles are found for other languages as well. For instance, Frota (2000) claims that narrow foci in Portuguese are always associated with a certain kind of accents. In the same way, Baumann (2006) and Baumann & Grice (2006) relate the form of accents to givenness in German.

Some excellent works have been published which propose a pragmatic relationship between tones and meanings, like ‘assertiveness’ or ‘statementhood’ (L-), ‘concessive continuation dependence’ (H%) for Bartels (1997), and ‘newness’ (H*) ‘prominent, but not part of the predication’ (L*) or ‘elements in a scale, but not part of the predication’ (L*+H) for Pierrehumbert & Hirschberg (1990). Marandin et al. (2005) relate the melody of final contours in French to the anticipated revision from the part of the speaker of the hearer.

These authors refrain from associating tones with information structural roles like topic and focus.

The relation between topics, foci or givenness and special contours is at best unstable. The lack of necessary association between accents and roles can be illustrated with examples in which different kinds of accents are used for topics and foci from the ones which have been proposed in the literature. Consider (6) which elicits a double focus in German. The answer to a double wh-question can consist of a single-pair answer, and I assume that this is the case in (6). The second focus, *den Dekan*, has a falling contour as it is the last accent in the sentence. But the first focus, *die Präsidentin*, has a rising contour without necessarily being a topic. This contour arises because in a sequence of two accents, the first one has a rising and the second one a falling contour, independently of the role of the constituent.

- (6) {Wer hat wen gesehen? }
 ((Die PRÄSIDENTIN)_P, (hat den DEKAN gesehen)_P (German)
 the president has the dean seen
 ‘The president has seen the dean.’

As far as topics are concerned, the preference for sentence-initiality is paired with a preference for rising tones. It may be the case that the rising tone is just reflex of non-finality of this accent.

To sum up this section, topics and foci have been analyzed by some linguists as the bearers of obligatory special contours. But the necessity of this relationship is not firmly established, and in fact, there are too many counterexamples showing that other accents can do the job in some contexts. In German, a focus has a falling contour because it is the last accent in the sentence, and the tone of a topic is rising because it is not the final accent.

Again, the preference for associating some specific contours with information structural roles is to be explained by general properties of the language.

5 Bearers of Accents

The preceding section has shown that there is no necessary relation between focus/topic on the one hand and special contours on the other. A concomitant question bears on the necessity of accents (and of deaccenting) in general in relation to focus/topic. Jackendoff (1972:247) formulates a rule which obligatorily relates a focus with an accent. "If a phrase P is chosen as the focus of a sentence S, the highest stress in S will be on the syllable of P that is assigned highest stress by the regular stress rules." Nearly all models relating focus with phonology rely on a direct correspondence between semantics and phonetics and requires an accent signaling in a direct way the presence of a focused constituent (see for instance Cinque 1993, Reinhardt 1981, Rooth 1985, 1992, Selkirk 1995, 2002, 2006, Schwarzschild 1999, Truckenbrodt 1999, Zubizarreta 1998 and many others).⁴

There are of course systematic and trivial exceptions to this rule, like the numerous tone and phrase languages⁵ which do not use accents at all. Xu (1999) shows that focus in Mandarin Chinese raises the pitch range of a focused word, and compresses the postfocal domain, but Mandarin has no accent in the usual sense of this term. West Greenlandic, a typical phrase language, has no lexical accent, and no tone, but still prosody is used in an interesting way. A focused

⁴ And nearly all models suggest that the correspondence between semantics and phonology goes through the intermediary of so-called F-marks which signal focus in the syntax (Selkirk 1995, this volume, Schwarzschild 1999, Féry & Samek-Lodovici 2006).

⁵ Many tone languages use F_0 only for lexical tone distinctions, or to increase or decrease the pitch ranges used in prosodic domains, but not for associating prominent syllables with special, pragmatically induced meanings, as is the case for pitch accents (see Hartmann, this volume).

constituent, a p-phrase, has phrasal tones with altogether larger excursions, and the whole register of the focused phrase is raised (see Arnhold 2007). Other tone languages mostly use syntactic and morphological operations to signal focus, and nearly no prosody at all, except for the melodies resulting from the changed phrasing.

The crucial question, however, is whether languages with pitch accents necessarily use them for topics and foci, or whether there are exceptions. In all-new sentences, i.e. in sentences with wide focus, Nuclear Stress and the preceding secondary accents are by-products of syntactic structure. Each p-phrase has a prosodic head, realized with a pitch accent, and the last head is called Nuclear Stress. The heads always fall on a lexical stress. This has been recognized by Chomsky & Halle (1968), Cinque (1993), and by a number of other syntactically oriented linguists. Things are completely different for narrow focus, which triggers an accent as the result of its pragmatic and semantic structure. Without entering into the details of the association between narrow focus and pitch accent, it may be observed that the relationship between the two holds in most cases. A ‘straightforward’ narrow focus is associated with a pitch accent, so that Jackendoff’s generalization may be claimed to hold without exception for such cases.

There are some interesting complications, though, for which a refinement of the relation between focus and accent is called for. One type of complication is the so-called Second Occurrence Focus (Partee 1999, Rooth 2004, Beaver et al. 2004, Féry & Ishihara 2006) which combines elements of association with focus and givenness. *Only vegetables* in (7b) is associated with the focus operator *only*, and is thus a focus, but it is also given, because it is repeated from (7a). The example comes from Partee (1999).

- (7) a. {Everyone already knew that Mary only eats [vegetables]_F} (English)
- b. If even [Paul]_F knew that Mary only eats [vegetables]_{SOF}, then he should have suggested a different restaurant

Rooth (2004) and Beaver et al. (2004) find only weak correlates of accent, and no pitch excursions on postnuclear SOF, but Féry & Ishihara (2005), examining SOF in the prenuclear position, find that a pitch accent is indeed present. The height of a SOF pitch accent is intermediate between the one of a narrow focus and the one of a given prenuclear constituent. In other words, SOF is realized in a position which allows prenuclear accents, but in the postnuclear region, accents are much lower, though significantly different from a non-focused word. This fact points to the importance of the phonology of a language in general in order to understand the accent pattern.

Another type of systematic exceptions has been investigated by Féry & Samek-Lodovici (2006), who find that in some cases, pitch accents may compete. This happens for instance when two adjacent or embedded foci compete for accent, and only one can win, as illustrated with the following sentences in (8), adapted from Rooth (1992).

- (8) {Who was fighting with whom?}
- a. [A old MAN]_F was fighting with a [young BOY]_F
- b. [A OLD man]_F was fighting with a [YOUNG man]_F
- c. [A OLD man who was wearing a Texan HAT]_F was fighting with a [YOUNG man who was wearing a Texan hat]_F

In (8a) the subject is contrasting with the object, and nuclear stress applies. In (8b), Rooth's case in which the adjectives are in contrast with each other is illustrated. The contrast on the adjectives suppresses the unmarked accent on

man in the subject.⁶ It must be observed that the question elicits both a focus on the subject and on the object, and that since the first occurrence of the subject is new, an accent is expected on the noun. Féry & Samek-Lodovici (2006) provide a purely prosodic explanation for the absence of stress on *man*. In their view, it is the adjacency between this word and the contrastive adjective (both are in the same p-phrase) which forces deletion of the stress on *man*.⁷ A longer, identical subject and object do not force deletion of the accent on *hat* in the subject,⁸ as shown in (8c), showing that a purely anaphoric explanation for deaccenting *man* is not enough. If it were, the entire subject would be deaccented by virtue of being identical to the object.

This section has concentrated entirely on focus, and has shown that an accent is associated with a focus as far as possible. But the relationship maybe loosened in some special constellations. As far as topics are concerned, the examples (1) and (2) already showed that ‘topic’ is not necessarily associated with an accent, depending on which topic is under consideration. Aboutness, familiarity, implicational and contrastive are the most well-known.

6 Deaccenting

If accent is not a reliable predictor of focus, could deaccenting the backgrounded part of the sentence be a better correlate of information structure? Givenness, like backgroundedness is often indicated with lack of accent.

Immediate problems arise with this view. Givenness is not obligatorily associated with deaccenting, as shown in (9).

⁶ The accent on *man* in the object would be suppressed anyway, because of givenness and postnuclearity.

⁷ Rooth (1992) provide a semantic explanation in which *man* is deaccented because of anaphoricity.

⁸ Though it is reduced (see Selkirk 2002, 2006 for the difference between focus and FOCUS).

- (9) {Who was loved by two men, Audrey or Lucy?}
It was Lucy.

In Schwarzschild's (1999) terminology, *Lucy* in (9) is 'entailed' by the previous question. But the fact that it was Lucy (and not Audrey) who was loved by two men is not. Givenness, thus, cannot be interpreted in a single way, and be always associated with deaccenting. Instead, givenness must be complemented with, or even replaced by 'entailment,' a semantic notion.

The second problem arising with an association of givenness with deaccenting is often a prosodic operation eliminating one of two adjacent accents, as illustrated in (8b-c). In short, deaccenting cannot be viewed as expressing uniquely givenness, as givenness cannot be assumed to be always accompanied by deaccenting.

7 Obligatory Phrasing

The last phonological correlate which has been claimed to be an obligatory phonological indicator of focus is phrasing. Prosodic phrasing is one of the most interesting aspects of the phonology of information structure, one of the reasons being its universality. No language can be said to lack prosodic phrasing. In the same way as our articulatory organs define and limit the segments we use in our inventories of sounds, our vocal tract is limited by air pressure and respiratory needs, which force the division of a long string of speech into smaller chunks of phrasing. And because these smaller prosodic chunks are compulsory, grammar use them for its own needs and insert breaks and tonal boundaries at syntactically and semantically relevant places, helping in this way both production and comprehension of speech. Another reason why prosodic phrasing requires our attention is that the syntactic reorganization of constituents in non-canonical word order, like clefting, dislocation, topicalization,

scrambling, and so on always goes together with reorganization of phonological phrasing. Because of the widespread view that phonology comes after syntax, phase-wise or as a whole module, it is seldom asked, and even more seldom answered, whether syntax may be influenced by the needs of prosody (but see for instance Samek-Lodovici 2005, Ishihara 2003, 2006 and Féry 2006, 2007 for answers).

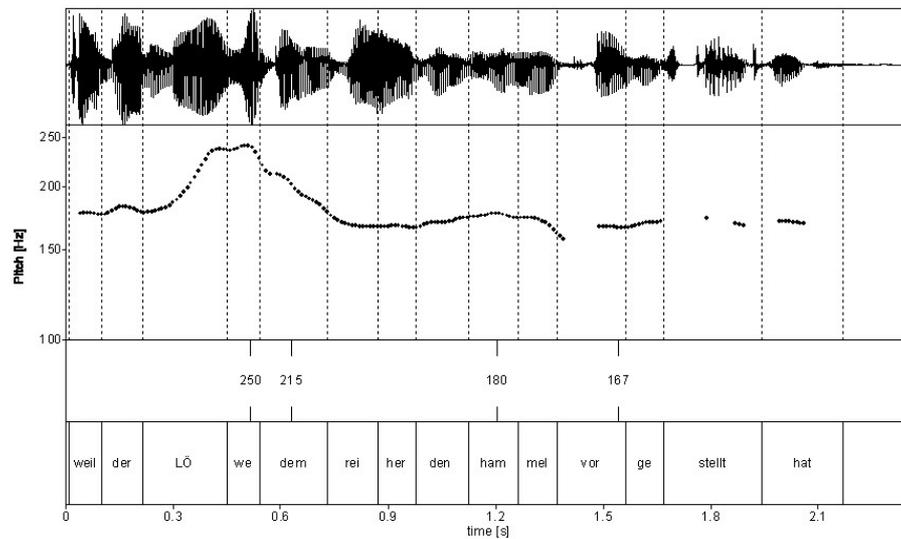
To express information structure, tone languages and phrase languages use syntactic and morphological means, accompanied by prosodic phrasing. As an example, it has been claimed that Chichewa, a Bantu tone language, inserts an obligatory right boundary after a focused constituent, separating the focused constituent from the rest of the sentence (see Kanerva 1990). In Chichewa, phrasing is realized by non-intonational means, like sandhi tones at the lexical level, and segmental lengthening.

In German and English, the effects induced by topics and foci are obvious. Beckman & Pierrehumbert (1986) have been influential in claiming that the absence of downstep (boosting of the F_0 associated with a high pitch accent) on a focused constituent was synonymous with an intermediate phrase boundary. In their approach, an intermediate phrase, which is a domain equivalent to the one which is called p-phrase in this paper, is the domain in which downstep applies. If downstep (or catathesis, as they call the phenomenon) is interrupted, their model predicts an obligatory boundary to the next intermediate phrase. Another line of thoughts associate prosodic phrasing with syntax (Gussenhoven 1992, Féry & Samek-Lodovici 2006). In this perspective, prosodic phrasing is triggered by syntactic structure, and only marginally by information structure. Fig.1 shows an example in which a different focus structure (narrow focus in the left pitch track, wide focus in the right one) does not affect the phrasing. The only change observed in relationship with narrow focus is a raising of the high tone on the narrow focus.

(10) a. *Weil der LÖWE dem Reiher den Hammel vorgestellt hat*
 because the.NOM lion the.DAT heron the.ACC wether presented has
 ‘Because the lion presented the wether to the heron’

b. *Weil der HUMMER dem LÖWEN den RAMMLER VORGESTELLT hat*
 ‘because the lobster presented the lion to the rabbit.’

a.



b.

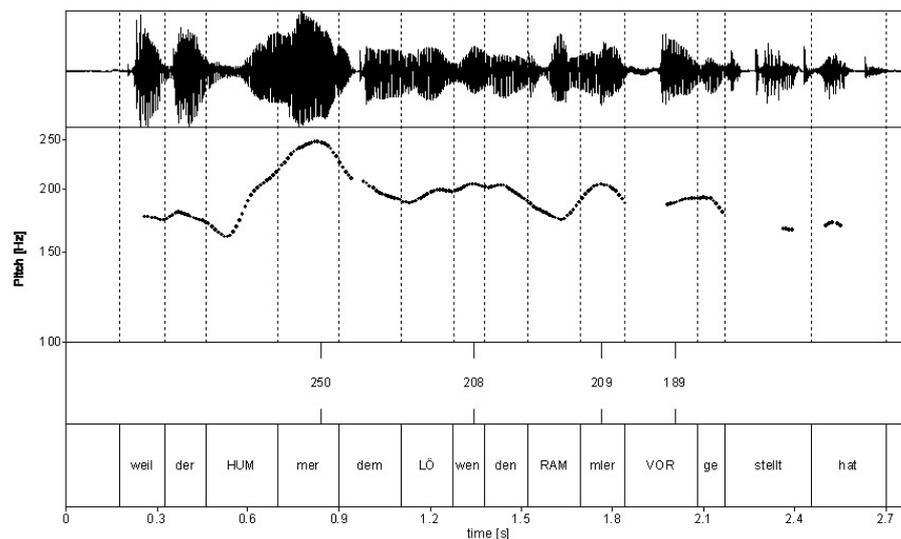


Fig.1: a. *An all-new sentence.* b. *A narrow focus on the first argument.*

Phonetic phrasing, with boundary tones and breaks, is extremely elusive because it is subject to fluctuations due to style, tempo, familiarity between speaker and hearer and so on, but once prosodic phrasing is understood as the part of grammar at the interface between syntax and phonology, it may not be necessary to rely on existing phonetic cues. To make a long story short, focus does not change the phrasing in raising the voice on the accented syllable, but it does change the phrasing in causing changes in syntactic structure.

8 Conclusion

This paper has uncovered a common misconception: that an information structural category needs to be associated to an invariant phonological (or for that matter, any grammatical) property. It was shown that the phonology is an important part of grammar for the implementation and signaling of information structure. Focus requires prominence, givenness require lack thereof, and topics are preferably located in positions in which their processing is optimal. Phonology is supportive in providing the necessary cues, but does not enter in the definition of the concepts.

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Notions and subnotions in information structure*

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Three dimensions can be distinguished in a cross-linguistic account of information structure. First, there is the definition of the focus constituent, the part of the linguistic expression which is subject to some focus meaning. Second and third, there are the focus meanings and the array of structural devices that encode them. In a given language, the expression of focus is thus facilitated as well as constrained by the grammar within which the devices that are used to encode focus operate. The prevalence of focus ambiguity, the structural inability to make focus distinctions, will thus vary across languages, and within a language, across focus meanings.

Keywords: corrective focus, contrastive focus, informational focus, focus ambiguity, focus type, focus meaning

1 Introduction

Three dimensions can be recognized in the analysis of information structure. First, there is the identification of the focus constituent, the constituent that represents the information which is subject to some focus meaning. Most obviously, this dimension concerns differences between ‘narrow’ and ‘wide’ focus (?). Second, there are the focus meanings themselves, sometimes referred to as ‘focus types’ (?; ?). Given that different focus meanings are expressed in different ways, the third and last dimension is the expression of focus, the structural means by which focus meanings are encoded. Within each of these dimensions, typological treatments should in principle be possible.

* Here cometh the Acknowledgement.

1.1 Size of the focus constituent

The terms ‘broad’ and ‘narrow’ are relative terms for the size of the focus constituent (?). In (1.1), the focus gets smaller from (1.1a) to (1.1c), while it shifts to the temporal element in the verb in (1.1d).

(A: What else can you tell us about Helen?)

B: She [used to drive a Renault CLIO]_{FOC} (A: Has she driven any other cars besides Fords and Chevrolets?)

B: She used to drive [a Renault CLIO]_{FOC} (A: What kind of Renault did she drive?)

B: She used to drive a Renault [CLIO]_{FOC} (A: Does she drive a Renault CLIO?)

B: She [USED TO]_{FOC} drive a Renault Clio

Example (1.1d) suggests that the nature of the focus constituent would appear to be semantic, rather than morphosyntactic. It is not necessarily the case that there are words that directly represent the semantic focus. Instead of *used to drive*, the speaker might have preferred the past tense form *drove*, which would be accented, even though the verb itself is outside the focus constituent and only the tense [PAST] is inside it. (?) discussed cases like these as ‘Affirmative Focus’. Instead of [PAST] the polarity may be in focus, as in *No, she DIDN’t drive a Renault Clio.* \footnote{a. een voetnoot}

1.2 Expressing meanings of focus

Languages vary in the extent to which information structure is encoded in the linguistic structure. The these structural means are listed by broad category below.

1. Syntax

a) position in syntactic structure

b) focus particle

2. Morphology

a) affixation

3. Phonology

a) presence of pitch accent

b) type of pitch accent

c) prosodic phrasing

Focus meanings are relations between information in the expression and a current score of information which the speaker assumes is held by the hearer, often referred to as the ‘background’. The information in sentences is not uniformly related to the background. Often, only part is intended as an update, while the rest is taken to be already part of it. The update is in the focus constituent. A frequently made distinction is that between ‘informational focus’ and ‘contrastive’ focus, recently indicated by ‘focus’ and ‘FOCUS’, respectively by Selkirk (this volume). A usual operational definition of informational focus is the answer to a question, as in (1.1), which adds information to the background. ‘Contrastive focus’ amounts to the correction of information in the background, as in *Not with a BLUE pen, but with a BLACK pen*. It was referred to a ‘counterassertive focus’ in (?), after (?), and is also known as ‘corrective focus’ (which term may be preferred to contrastive focus’, as it may be mistaken for narrow informational focus, e.g. ?, ?)).

A third meaning amounts to an explicit marking of background status, which occurs in many language as topicalization. Section ?? describes some further focus meanings in English.

1.3 Morphosyntax

Information structure is often encoded in more than one type of structure, either independently or by implication. When languages designate a position in structure as a focus position, there will be implications for the phonological phrasing, or there may be independent phrasing requirements.

Basque requires the focus constituent to be in the final XP, disregarding the sentence-final verb. This means that (??) is ungrammatical if 'to the teacher' is in focus (cf. A1), but not if 'of the friends' (cf. A2), 'the books' or 'the books of the friends' are (cf. A3).

A1: To whom did you give the book?

A2: Whose book did you give to the teacher?

A3: What possession of the friends did you give to the teacher?

A4: What did you give to the teacher?

maixuári lagúnen liburúak emon dotzaras

teacher-dat friends-gen books give aux

'I gave the friends' books to the teacher'

The replies to A2, A3 and A4 have the same phonological representation. However, with corrective focus for *liburúak*, the sentence would be distinct from the versions in which either *lagúnen liburúak* or *lagúnen* are in focus. This is because a corrective focus constituent begins with an intermediate phrase boundary, which would not otherwise be there before *liburúak*. Because within an intermediate phrase, accents are downstepped, a corrective focus constituent in Basque avoids being downstepped by virtue of being in the first accented phrase of an intermediate phrase.

Topicalization may signal information status, inasmuch as it typically establishes a topic ('old information'), about which new information is to be provided in the rest of the sentence. Topicalization does not alter the surface word order if the topicalized constituent would otherwise be sentence-initial, but may have

a prosodic effect. In Wolof, an SVO language, focused constituents appear immediately before the verb inside the same IP, which explains why [mburu mi] precedes [la lekk] in (1.3). Focus for the (non-initial) object requires that the subject be topicalized. Without topicalization, the clause is a single IP, but a topicalized constituent has an IP to itself. That is why there is an IP break after the subject *Peer* (?; ?).

{Peer} {mburu mi la lekk}

Peter 3SG+OBJFOC bread the eat

‘Peter ate the BREAD’

Because the focus constituent must occur in the same IP as the verb, there is no IP break after a focused object, as in {Mburu mi la lekk} ‘He ate the BREAD’ or in {Peer ak Sàmba ñoo lekk} ‘PETER and SAMBA are eating’. Somewhat paradoxically, then, an IP break after a sentence-initial constituent marks it as outside the informational focus.

Particles expressing presentational focus occur in many Asian languages. Japanese[wa], placed after the subject in this SOV language, marks the subject as old or reactivated information. It competes with [ga], marking the subject is new information. That is, (??a) conveys that the focus is not the subject, and therefore must be somewhere in the remainder of the sentence. By contrast, (??b) implies that the subject is included in the focus constituent, but is otherwise ambiguous as to the size of the focus constituent. (The particle [o] just marks the direct object.)

(A: Who gave Keiko a book?/Who gave a book to whom?/What was going on?)

Kaoru ga Keiko ni hon o ageta

Kaoru SUBJ-PART Keiko to book OBJ-PART gave

‘Kaoru gave Keiko a book’

‘Kaoru gave Keiko a book’

‘Kaoru gave Keiko a book’

A: Who did Kaoru give the book to?/What did Kaoru give Keiko?/What’s with Kaoru?)

Kaoru wa Keiko ni hon o ageta

‘Kaoru gave a book to Keiko’

‘Kaoru gave a book to Keiko’

‘Kaoru gave a book to Keiko’

Importantly, the prosodic structures of the different interpretations will differ, because the focus constituent, whether informational or corrective, must begin an intermediate phrase. The effect is that the focus constituent is never downstepped (cf. Basque above).

Sundanese has three particles expressing degrees of ‘newness’ of information: *mah* signals informational focus, *tae* reactivating focus, while *teh* signals old information. In (1.3)-(1.3) the constituents to which the particles are attached are underlined. Example (1.3) shows how *teh* can be used to mark old information in a question, and how *mah* can be used to mark the requested information. Interestingly, as shown by (1.3), the constituent carrying old information (‘interesting’) may occur inside the XP to which the particle is appended. In (1.3), the speaker uses *tae* to mark ‘water’ as recoverable information which is re-activated (‘As for the water...’) (?).

A: Anu indit ka pasar *teh* saha

REL go to market *teh* who

‘WHO then is the one going to the market’

B: Nu indit ka pasar Dadas mah

REL go to market Dadas *mah*

‘DADAS is going to the market’

A: Eusina buku eta *teh* naha kataji?

contents+POSS book that *teh* Q interesting

‘Are the contents of that book INTERESTING?’

B: Komo bae kataji mah

above all interesting *mah*

‘VERY interesting’

Cai tae diteundeun kana meja

water *tae* PASS-put to table

‘The WATER was put on the TABLE’

Finally, Bulgarian and Russian have a question particle *li* which marks narrow focus if attached to a syntactic phrase, but broad focus if attached to the verb. Russian (??a) is a narrow focus sentence, but (??b) has broad focus (?).

Knigu li Anna pročitala?

book Q Anna read

‘Did Anna read a BOOK?’

Pročitala li Anna knigu?

‘Did ANNA read a BOOK?’

1.4 Morphology

Wolof has a set of verbal affixes expressing information structure by the side of aspectual and temporal information, which take different forms depending on person (?; ?). For instance, a sentence with broad focus and ‘presentative’ aspect, a verb form indicating temporal and locative coincidence with the speech act, takes the paradigm in the first column of (1.4), which contains the stem for ‘eat’. There are some six further paradigms, plus the three given in columns 2, 3 and 4. The choice among these latter three depends on the constituent in focus. Thus, (1.4a) is a neutral sentence, (1.4b) has the verb in focus, and (1.4c) has *Peer* in focus. Unlike the forms in columns 1, 2 and 3, which can be free-standing expressions, those in column 4 require a preceding object.

	Presentative	Verb focus	Subj focus	Obj focus
1 SG	maa ngi lekk	dama lekk	maa lekk	laa lekk
2	yaa ngi lekk	danga lekk	yaa lekk	nga lekk
3	mu ngi lekk	da(fa) lekk	moo lekk	la lekk
1 PL	nu ngi lekk	danu lekk	noo lekk	lanu lekk
2	yeena ngi lekk	dangeen lekk	yeena lekk	ngeen lekk
3	ñu ngi lekk	dañu lekk	ñoó lekk	lañu lekk

a. Peer mu ngi lekk	b. Peer dafa lekk
Peter 3sc sg+Presentative eat	Peter 3SG+VERBFOC eat
‘Peter is eating’	‘Peter DID EAT’
c. Moo lekk mburu mi	d. Loolu la lekk
3SG+SUBJFOC eat bread the	that 3SG+OBJFOC eat
‘(S)HE ate the bread’	‘(S)he ate THAT’
{endteldoor	

1.5 Phonology

The prosodic structure can express information structure by the phrasing, by pitch accent distribution and by using special pitch accents or boundary tones. Typically, the effect is to make the focus constituent phonetically prominent. For instance, downstep, a pitch range reduction which naturally goes together with non-prominent meanings, is suspended in Japanese focused constituents, as a result of its occurrence at the beginning of a downstep domain (?).

?) first presented a case of sensitivity to phrasing. In Chicheŵa, the right edge of the focus constituent coincides with a phrase, identified as the phonological phrase by Truckenbrodt (?).

Specific distributions of pitch accents commonly signal the location of informational and corrective focus in West Germanic languages.essed by deaccenting words after the focus constituent within the ι in English, German and

Dutch. Before the last pitch accent, accents are obligatory within the focus constituent, but optional before it. Deaccentuation before the focus will be more common when it is corrective (see also (??)).

The third option, different pitch accents, is used for making a contrast between broad (neutral) focus and narrow focus in European Portuguese, as explained in section ???. Unlike English, European Portuguese does not deaccent final words in sentences with early focus, but uses the pitch accent HL to mark the focus and the ‘neutral’ H+L to mark the post-focal constituent. This is shown in (1.5a), which has broad focus and is realized with high level pitch between the pre-nuclear H and the neutral H+L, and (1.5b), which has narrow focus on *café*, where it has the focal H+L, keeping H+L for the post-focal word. Since this second H-tone has strongly reduced pitch range, its salience is low (?, p. 274).

1.

=1 =20 =30 =30 =14 =10 .

(Aque-la loja tam-bem) vende lotes de ca-fe lusitano

| |
H* H+L* (L_t)

2. ‘(That shop also) sells packages of Lusitanian coffee’

=1 =20 =30 =14 =18 =13 =10 .

A: (Tam-bem ven-do) CAE lusitano

| |
H*+LH+L* (L_t)

$$\{ [\text{amader}]_{\phi} [\text{k}^{\text{h}}\text{arap}]_{\phi} [\text{biman-er}]_{\phi} [\text{opor b}^{\text{fi}}\text{æ}]_{\phi} \}_{\iota}$$

$$\begin{array}{ccccccc} | & & | & & & & \\ \text{L} & & \text{H}_{\phi} & & \text{L} & & \text{H}_{\phi} & & & & \text{L}_{\iota} \end{array}$$

‘Our fear of DEFECTIVE aeroplanes’

1.6 Further focus meanings

In addition to informational focus, corrective focus and reactivating focus, West Germanic languages make a distinction according to the kind of update of the background. If the update concerns a historical event, whether imagined, completed, future, or otherwise, a different accentuation is used from situations in which the update concerns a further definition of the background. Thus, (??) are the ‘eventive’ counterparts of the ‘non-eventive’ sentences in (??). For instance, in (??c), there must be a King of France, while in (??c), there needn’t be (? , p. 85). A distinction between ‘definitional’ and ‘contingency’ focus can additionally be made within the class of non-eventive sentences (?).

- (1)
 - a. DOGS must be carried (‘You must bring dogs here and carry them’)
 - b. The SUN is shining (‘It is shining right now’)
 - c. The KING of FRANCE is bald! (‘Something must be done to make his hair grow back’)

- (2)
 - a. DOGS must be CARRied (‘If you have a dog, you must carry it’)
 - b. The SUN is SHINing (‘Imagine this idyllic place!’)
 - c. The KING of FRANCE is BALD (‘Should there be such a person, his baldness is a matter of course’)

Lastly, when the focus constituent is confined to the polarity of the sentence, English makes a distinction between contrastive focus and counterpresuppositional focus. In the latter case, the communication is intended as a correction in the background of the listener, while contrastive focus corrects an attempted addition by the listener (cf. section 1.2). Examples (??) have contrastive ('corrective') polarity focus, while (??) have counterpresuppositional polarity focus. The difference is particularly clear with negative polarity. (?).

- (3) a. We're NOT in France!
 b. We DON'T have anything to paint!
 c. I DON'T know him!
- (4) a. We're not IN France! ('Why don't you speak French?')
 b. We don't have anything TO paint! ('Why don't you start painting?')
 c. I don't (even) KNOW him ('Why don't you ask him?')

Informational polarity focus is expressed as if there is full focus in English.

- (5) A: Is he the GARDener?
 B: Yes, he is the GARDener (*Yes, he IS the gardener)

The Restricted Access of Information Structure to Syntax – A Minority Report

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This paper sketches the view that syntax does not directly interact with information structure. Therefore, syntactic data are of little help when one wants to narrow down the interpretation of terms such as “focus”, “topic”, etc.

1 Introductory Remarks

For sentences such as (1), it seems evident that the movement of *who* in (1a-b) or *he* in (1c) is triggered by grammatical requirements linked to clausal typing, the scope-taking of *wh*-phrases, the assignment or checking of Case, the obligatoriness of overt subjects in finite clauses (the “EPP”), and the like. In many grammatical models such as Minimalist syntax (Chomsky 1995) or OT (see Grimshaw 1997), this observation has been generalized and transformed into a basic architectural assumption for syntax: movement is ‘costly’, and it thus applies only if necessary, i.e., if it is “triggered” or “licensed” by mechanisms such as feature checking, or by the need to avoid violations of principles with a rank higher than the one of the ban against overt movement.

- (1) a. I do not care who you have met t
b. a person who you have never met t
c. He seems t to be likely t to win the game

Whether such a model of syntax can be maintained in full generality depends (among other things) on the analysis of sentences such as (2) and (3). These word order alternations are neither immediately related to mandatory aspects of sentence structure such as encoded by the EPP, nor do they satisfy grammatical needs following from formal/lexical properties of the displaced phrase (or the head agreeing with the landing site) such as a *wh*-feature. Still, the application of operations such as topicalization (2a), heavy NP shift (2b), or scrambling (3) is not arbitrary, but rather seems to reflect distinctions of information structure. It is tempting to analyze the interaction of information structure with syntax with the methods developed for (1), but this presupposes that notions such as topic, focus, givenness, etc. find a clear-cut definition in the theory of syntax.

- (2) a. Mary, I really like ___
 b. He showed ___ to her the best pieces of his collection of striped stamps issued in the first half of the last century.
- (3) *dass den Schauspieler niemandt erkannt hat*
 that the-acc actor nobody-nom recognized has
 “that nobody recognized the actor”

The position defended here is that syntax and information structure interact very indirectly only. Syntax (proper) can therefore offer very little insight into the issue of the precise characterization of the core notions of information structure.

2 Triggering vs. Exploitation

Forces driving syntactic computations must be distinguished from the consequences of structural properties of the resulting constructions. Consider, e.g., the passive. A formal analysis works with the following ingredients: Some morphological change of the verb or the presence of a certain auxiliary makes it

impossible to realize the external argument role of the verb as a primary syntactic argument, in particular, it can no longer appear in the subject position. In some languages, nothing additional happens, but in most languages, further changes are triggered. Often, the verb's capacity to govern accusative depends on the presence of an external argument, so that the direct object shifts to nominative in a passive. In many, but not all languages, this shift is furthermore accompanied by a movement of the nominative NP to the subject position.

Everything that is syntactically particular to the passive can be captured in this way. The “function” of the passive does not figure in the grammatical *computation*. Its functional aspects must be related to properties of the *resulting* structural object (see also Fanselow & Felix 1987). E.g., some languages such as Lummi require that a subject must not be lower on the person-number-hierarchy than the object (Bresnan, Dingare & Manning 2001). Given that the passive demotes the external argument, it helps to avoid expressive gaps that would arise when a third person actor affects a first person patient. A further function of the passive is obvious in languages that restrict question formation or relativization to subjects. The demotion of the external argument makes it also possible to not mention it at all, so that the passive is adequate in situations in which courtesy, ignorance, or other factors favor the omission of the subject.

When the passive changes grammatical functions, the promoted object is closer to the left edge of the clause in subject initial languages, and the demoted external argument can be realized in the right periphery. Since the edges of a clause are often linked to topic and focus, the choice of a passive can also be influenced by information structure. We can link the “functions” of the passive to linear and hierarchical properties of the structural representation, but nothing is gained if we make functional aspects part of the computation.

Functional ambiguities as those of the passive are an indication that the formation of a construction is not driven by its functions. Heavy NP-Shift (hnps) is a further example. English VPs are easier to process if their longest constituent comes last (Hawkins 1994), and focused material also prefers positions far to the right. Corpus analyses (Arnold et al. 2000) reveal that hnps constructions are used for both functions. Again, no insights would be gained if one or both of these functions were made part of the grammatical computation—the functions arise as a consequence of properties of the product, for which it does not matter how the structure was generated.

Functional ambiguities also characterize the first position in German clauses, which can be filled by unmarked subjects, by topics and by foci. Even discontinuous NPs are pragmatically ambiguous. *Bücher* ‘books’ can be a (contrastive) topic or a (corrective) focus in (4). In addition, (4) can answer questions such as “what have you bought”, “what have you done”, and even “what happened”, which shows that NP discontinuity is compatible with a focus on the complete NP, or the VP and TP dominating it (Fanselow & Lenertová 2006, Puig Waldmüller 2006). The formation of discontinuous noun phrases opens a potential for different informational functions to the parts of the noun phrases, but that potential need not be made use of.

- (4) *Bücher hab ich mir ein paar* — *gekauft*
 books have I me a couple bought
 “I’ve bought some books”

The presence of (massive) functional ambiguities makes it unlikely that these functions play a role in the generation of a construction. At least for the core of the syntax, we can exclude the ‘strong’ functionalist view according to which

some syntactic operations are triggered by aspects of information structure such as a ‘focus’ feature.

A ‘weak’ functionalist view assumes that movement is triggered by formal aspects only (such as the EPP feature), but it allows that the positions targeted by movement may be grammatically linked to information structure, either because they are specifiers of heads related to information structure (see Rizzi 1997, Pili 2000, Frey 2004), or because features linked to information structure are checked as a by-product of movement (Fanselow 2002). The weak functionalist view may be the majority position in (minimalist) syntax, but a number of observations indicate that a stronger independence of the mechanics of syntax and information structures is called for. E.g., Pereltsvaig (2004) shows that in Italian and Russian predicative clauses, DP- and AP-topics must appear at the left edge of the clause while they occupy different structural positions. In other words, it is only the linear position, but not the exact hierarchical constellation that matters for information structure here. The preverbal focus position of many SOV languages is also not structurally identical for objects and subjects: the focused elements stay in their respective base positions (the VP-complement for objects, and the specifier of vP/TP for subjects), and acquire the preverbal status when elements separating them from the verb (objects and adverbs, in the case of subjects) are scrambled to the left. Results of syntactic processes can be exploited by distinctions of information structure, but this does not show that these processes are triggered by them.

3 The Nature of Exploitation

Even if syntax is not driven by information structure, the mechanisms by which properties of constructions are exploited in the interest of expressing information

structure must be made precise, and, at least in principle, in this context it could be determined which notions of information structure are relevant for syntax.

In the previous section, we saw that linear order rather than structural hierarchy matters for information structure. This could be captured in terms of constraints aligning the edges of phrases with categories such as focus or topic. Even this extremely weak version of functionalism seems untenable – at least for German, and at least for clause-internal material. Word order responds to prosodic requirements rather than to information structure. Since prosody is the primary means of realizing information structure in German, there is a relation between syntax and information structure, but it is indirect. We will discuss various layers of structure in German sentences, beginning with vP, and working our way up to and beyond CP.

In his seminal study on German word order, Lenerz (1977) argues for a decisive role of focus in licensing word order variation. In a somewhat simplified version of his model, X may precede Y if X precedes Y in ‘normal’ order determined by argument structure, or if $X > Y$ means that old information precedes new one. The informational notions are fixed by several tests such as question-answer congruence. If ‘focus’ is defined as that part of an utterance that corresponds to the *wh*-phrase in the (implicit) question which the utterance answers, then ‘reordering’ (compared to normal order) is licensed if it leads to a more rightward position of the focus.

German is a subject $>$ object language. Therefore, (6a) is a good answer to (5a), because the subject precedes the object, but (6b) is acceptable, too, because the given object precedes the new subject. In contrast, (6b) is not an answer to (5b): in such a context, (6b) violates both subject $>$ object and old $>$ new.

-
- (5) a. *Wer hat den Hubert eingeladen*
 who-nom has the-acc Hubert invited
 “Who invited Hubert?”
- b. *Wen hat der Gereon eingeladen*
 who-acc has the-nom Gereon invited
 “Who did Gereon invite?”
- (6) a. *Ich denke, dass der Gereon den Hubert eingeladen hat*
 I think that the-nom Gereon the-acc Hubert invited has
- b. *Ich denke, dass den Hubert der Gereon eingeladen hat*
 “I think that Gereon invited Hubert”

This restriction on scrambling affects vP (Fanselow 2001, Haider & Rosengren 2003), or at most vP and TP. Two remarks are in order. First, reordering within TP is optional. Up to now, no condition has been identified that forces scrambling, as Haider & Rosengren 2003 show. Second, the focus-related constraint on reordering within TP can be understood easily in terms of accent placement. There are various theories of accent placement in the German vP or TP (Cinque 1993, Samek-Lodovici 2005, Féry & Kügler 2006, among others) which all more or less imply that the ‘main’ accent should be as far to the right as possible. The constraint is violable in the sense that it does not rule out the realization of base-generated “normal” order. However, it constrains movement (scrambling) because an application of movement within TP must not make the structure worse with respect to accent placement. The constraint does not trigger movement, and it is only indirectly linked to information structure – the relevant concept is the right alignment of main stress in the German clause (vP/TP) and not “focus” (while stress is of course related to information structure). Many further OV scrambling languages function in more or less the same way (see also Buring 2006).

In a series of papers culminating in Frey (2004), Werner Frey has argued that the Lenerz model needs to be elaborated by the postulation of a position above TP for sentence topics, to the left sentence adverbials, see also Haftka (1995). According to Frey, the notion relevant for topic placement is “aboutness”, as proposed by Reinhart (1981, 1995). In front of the topic position, Frey (2005) assumes a position for contrastive phrases. This is in line with a fairly old observation (not really acknowledged in the literature before Haider & Rosengren (2003)) that ‘new material’ can be fronted to the left periphery of the middle field under restricted circumstances.

The existence of a position for aboutness topics, preceding subjects and sentence adverbs, is not beyond doubt, however. On the empirical side, closer scrutiny reveals that the ordering facts of German do not really support, and sometimes even refute, the postulation of such a position (see Fanselow 2003, 2006). In a recent acceptability rating experiment with auditory presentation, Caroline Féry and the present author could not reproduce basic judgment patterns implied by Frey’s model.

Nearly all observations concerning topic placement in Frey (2004) involve the positioning of topics relative to sentence adverbs. Engels (2004) shows, however, that the position of topics relative to sentence adverbs is better explained if the latter are analyzed as focus sensitive operators, cf. also Fanselow (2006). Frey (2004) concedes that a focus sensitive use of sentence adverbs is required for certain constructions. The approach proposed by Engels is thus more parsimonious in terms of the number of uses postulated for sentence adverbs, but also in terms of the number or notions relevant for serialization: reference to a notion of topic can be avoided (a conclusion which Engels does not draw in general, however).

We will comment on contrasted XPs at the left periphery of the middle field in the next section, and turn directly to Spec,CP, the position preceding the finite verb in main clauses. Spec,CP can be filled in various ways: by the highest element of the argument hierarchy in a clause (usually, the subject) or by any adverb or PP preceding the highest argument in normal order (temporal and sentence adverbs). These elements are those that appear at the left edge of the middle field without special pragmatic licensing. In addition, any element that can be scrambled to the left edge can show up in Spec,CP, too. We therefore find “given” objects and clause-mate topics in both slots. The generalization capturing all cases is that the leftmost element of the middle field can also show up in Spec,CP, see Fanselow (2002), Frey (2004, 2005) and Müller (2004) for different accounts, taking up basic insights of Bhatt (1999). These proposals have in common that the movement of the leftmost element of the middle field to Spec,CP is a purely formal operation, unrelated to pragmatic factors going beyond the licensing of being the leftmost element of the middle field.

Focused elements appear in Spec,CP, too, as the question-answer pair in (7) reveals. The focused object *die Bibel* cannot have reached the leftmost position of the middle field by scrambling (because it bears the main accent), so it has moved there on a path different from the one described above.

(7) *Was hat Maria gekauft?*
 What has Mary bought

Die Bibel hat Maria gekauft
 The bible has Mary bought
 “What did Mary buy? Mary bought the bible”

Similarly, sentence topics originating in embedded clauses cannot reach the matrix Spec,CP via scrambling, because scrambling is clause-bound.

Consequently, sentences such as the second one of (8) have a different derivation. Frey (2005) states that topics from embedded clauses must bear a pitch accent and be contrastively interpreted.

- (8) *Ich erzähl Dir was über Maria.*
 “Let me tell you something about Mary“

Der Maria meint Peter dass wir helfen sollten
 The-DATMary means Peter that we help should
 “Peter thinks that we should help Mary”

The factor licensing focus preposing as in (7) once again is prosodic in nature. Building on observations of Büring (1997), Krifka (1994) and Jacobs (1991), Fanselow & Lenertová (2006) argue that “focus”-fronting is a movement crucially affecting accented rather than focused categories. The first argument is that *parts* of the focus-XP rather than the focus-XP itself can be fronted as long as they bear the focus accent. We already saw this above: (4) may be interpreted with VP- or TP-focus, even though only the stressed part of the object is fronted. The second observation is that meaningless material (i.e., parts of idioms) can be fronted to Spec,CP as long as it bears an accent. Finally, the locality constraint on fronting does not involve pragmatic criteria: rather, so-called focus fronting cannot cross accented phrases. German thus has no focus movement in a strict sense, rather, the operation transports the leftmost XP with a falling accent to Spec,CP. Prosody links the latter property to information structure, so there is an indirect link between syntax and focality.

Similar arguments apply to topic fronting. As Jacobs (1996) observes, topic fronting can be partial as well, and even parts of idioms, i.e. meaningless XPs, can be fronted when the full idiom denotes the topic and when its fronted part

bears the rising accent. Both topic and focus movement thus go for prosodic rather than pragmatic properties.

There is little evidence for a direct impact of information structure on German syntax. This is hardly surprising: distinctions of information structure are primarily coded in prosodic terms. There is no need for additional syntactic encoding, but syntax is sensitive to prosodic differences. The leftmost accented phrase (be the accent falling or rising) can move to Spec,CP, irrespective of whether it bears an information structure function or not, and scrambling must not worsen the violation profile of a sentence for the constraint that aligns the nuclear accent of the clause with the right edge of TP. Probably, other intonation languages behave in the same way (see Fanselow & Lenertová 2006 for a crosslinguistic overview, and Williams 2003 for a prosodic view of Heavy NP Shift in English.) Facts may be different when we consider the domain above CP (Left Dislocation, Hanging Topics) in German, see Frey (2005) for a discussion. In this domain, German grammar may fall in line with the syntax of topic prominent languages such as Chinese or Japanese.

4 Can and Should We Go Beyond the Licensing of Exploitation?

Scrambling and the fronting of accented XPs to Spec,CP are *optional*, i.e., the prosodic factors (correlated with information structure) are necessary but not sufficient conditions for movement. Can we identify factors that trigger fronting? If such factors exist but are left unidentified, one runs the risk that even the very indirect licensing function of information structure that we observed is non-existent – it could be a side effect of other factors truly responsible for displacement.

Frey (2005) has brought the notion of “contrast” into the discussion of German word order. According to him, focus fronting and long topic movement

are only possible when there is an (additional, implicit) contrast involved. Thus, he considers (9c) an odd answer to (9a) in a normal context.

- (9) a. *Wo liegt Köln?*
Where lies Cologne
“Where is Cologne situated?”
- b. *Köln liegt am Rhein*
Cologne lies on-the Rhine
“Cologne is on the river Rhine”
- c. *Am Rhein liegt Köln*

The effect is certainly subtle – it may involve not more than the existence of a contextually salient set of alternatives from which the answer selects. We can front the focus if it picks an answer from that set, but also, one should add, when we reject such a presupposition.

Drubig (2003) claims that focus fronting is always confined to situations in which there is a delimited set of contextually salient alternatives. For German, fronting is still just an option under such circumstances, so that reference to ‘contrast’ at best narrows down the set of contexts in which movement is possible. However, an XP can move in German even when contextually salient contrast sets cannot be assumed. Contexts normally do not specify alternative sets for names for new students, yet (10b-c) are perfect answers to (10a). (13) illustrates the same point: a noun phrase referring to a quantity can be fronted even though it is not likely that contexts establish salient alternative sets here.

- (10) a. *Wie heisst die neue Studentin?*
“What is the name of the new student?”
- b. *Anna Lesinski heisst die Gute*
A.L. is-called the good

- c. *Anna Lesinski denk ich dass sie heisst*
 A,L. think I that she is-called

- (11) *Wieviel kosten der Roman von Anna und die Gedichte von Peter?*
 “How much do the novel by Anna and the poems by Peter cost?”

40 Euro kosten die beiden Bücher zusammen
 40 euro cost the both books together
 “the two books cost 40 Euro together”

“Contrast” is thus not necessary for focus fronting in German. Is the notion of exhaustiveness that Kiss (1998) identifies as being crucial for Hungarian more successful in capturing the conditions under which XPs are fronted in German? We have already observed that accented objects, or even accented parts of objects, can be fronted in VP- or TP focus contexts, which shows that it is more the phonological shape rather than the pragmatic status of an XP that determines whether it can be fronted. The series of sentences in (12) is a possible answer to “what did you do on Sunday?”, and it shows that “exhaustivity” is at best a property of a full utterance, but not a property of an individual sentence with focus fronting.

- (12) *Nun, Zeitung habe ich gelesen, ich hab den Wagen gewaschen,*
 Well newspaper have I read; I have the car washed
ich habe telefoniert, und so weiter
 I have talked on the phone and so on
 “Well, I read the newspaper, I washed the car. I had some phone
 conversations, and so on ...”

“Focus” fronting does not have to be licensed by additional pragmatic properties in German – at least, such extra conditions have not been identified so far. This is what one expects if focus placement is driven by prosodic factors in German.

5 Conclusions

Our discussion of German word order has led us to conclude that information structure is *not* encoded in syntax in German, at least not within CP. Prosody defines the limits of word order variation in German, and the link between prosody and focus/topic creates the impression, albeit incorrect, that German syntax responds to information structure. For this reason, a closer look at German syntax also will not help in getting a clearer understanding of the notions of information structure.

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Focus and Tone

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Tone is a distinctive feature of the lexemes in tone languages. In intonation languages, tone marks information structural categories such as focus. Focus in tone languages is usually marked by syntactic and morphological means, but some languages also make use of intonation strategies. The present article discusses intonation focus marking in these two different language types.

Keywords: Tone (language), intonation (language), focus, pitch accent, prosodic phrasing

1 Introduction

This article aims at a definition of *focal tone*, i.e. tone that signals the information-structural category of focus. It analyses focal tone from two different typological perspectives. First, it examines how tone determines focus in intonation languages. Second, it looks at the relation between focal and lexical tones in tone languages. Due to possible conflicts between these tones, tone languages make much lesser use of focal tone than intonation languages do when it comes to the realization of focus. Instead, tone languages either resort to morphological or syntactic focus strategies, or employ other prosodic strategies to mark a focused constituent.

2 General Properties of Tone

Tone is a phonological category that distinguishes words or utterances. It refers to pitch differences perceived on the basis of variation of the basis frequency

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(f₀). Since pitch in language varies considerably, depending on sex, voice or mood of the speaker, it is not the absolute pitch value that determines tone, but its relative value within a word or phrasal contour. A language that uses tone to differentiate word meanings is called a *tone language*.

We distinguish two types of tones: *Level tones* are characterized by a constant pitch. Tone languages have at least two contrasting level tones, a high (H) and a low (L) tone. In addition, many tone languages have a mid tone (M), and may even possess more distinctive level tones. *Contour tones* consist of a combination of two level tones. Rising tones combine an L and an H tone (L+H), and falling tones combine an H and an L tone (H+L). Evidence for contour tones as tonal combinations comes from Hausa, a Chadic tone language with a fairly simple tonal system (H, L and H+L). (1) shows that contour tones are derived under various circumstances. (i) Some Hausa words have optional vowel elision (VE) deleting the segment, but not the associated tone. The resulting *floating tone* reassociates with the preceding tone bearing unit (TBU), resulting in a falling tone (1a). (ii) Underlying floating tones as parts of suffixes combine with preceding tones in word formation processes, as in the formation of verbal nouns (1b), or definite noun phrases (1c), cf. Newman (2000:604):¹

- (1) a. mùtúmì → mùtúm ` (VE) → mùtùm (H+L) ‘man’
 b. dáawóo + `wáa → dáawóòwáa ‘(the) return’
 c. hùulá + `r̄ → hùulâr̄ ‘(the)
 cap’

¹ Concerning the notation of tones, I follow the Africanist tradition and mark a high tone with an acute accent on the TBU (á), a low tone with a grave accent (à), and falling and rising tones with a combination thereof (â vs. â).

Tone languages use tone to differentiate lexical (2a) and grammatical (2b) meanings, as illustrated again with minimal pairs from Hausa (examples in (2b) are from Newman 2000:600):

- (2) a. tsíiríi – tsíiríi ‘heap – rising high (of water or fire)’
 gòodíyáa – góodiyáa ‘gratitude – mare’
 gàagàràa – gáagàráa ‘be impossible for – cut with blunt instrument’
- b. màatáa – máatáa ‘wife – wives’ *plural*
 dáfàa – dàfáa ‘to cook – cook!’ *imperative*
 sháa – sháà ‘to drink – drinking’ *verbal noun*
 táa – táà ‘she (completive) – she (potential)’ *aspect*

I have not come across a minimal triple in Hausa, but minimal n-tuples exist in many tone languages, see e.g. Yip (2002).

Regarding the phonological representation of tone, we follow the tradition of autosegmental phonology (Leben 1973, Goldsmith 1976) and assume that tones are represented on a tier that is associated but otherwise independent from the segmental tier. They are associated with the nucleus of the syllable, i.e. with vowels or syllabic consonants.

3 Focal Tone in Intonation Languages

Tone plays a fundamentally different role in *intonation languages* (sometimes also called *stress languages*), which use “suprasegmental phonetic features to convey ‘postlexical’ or sentence-level pragmatic meanings in a linguistically structured way” (Ladd 1996:6). This section discusses pitch accent, which is the central suprasegmental feature that is relevant for focus identification in intonation languages.

For this discussion it is important to keep apart the linguistic concepts of stress, accent and tone, especially since they often overlap, cf. Downing (2004).

Generally, *stress* is an abstract term that refers to the manifestation of prominence. It is assigned to the strong syllable of a prosodic foot. Thus, stress forms the basis of the rhythmic organization of a language. Its phonetic correlate is an increase in duration, loudness, or pitch.

In addition, stressed syllables may receive an *accent* on a higher prosodic level. The function of this accent is to mark prosodic phrases (*phrasal accent*). Its assignment depends on requirements of information structure: The phonological component contributes to structure the linguistic discourse into known or old parts on the one hand, and new, salient, or important parts on the other by assigning accents to the latter. Phonetically these accents are the result of pitch variations, hence the term *pitch accent*. For more discussion of these concepts, see Ladd (1996), Gussenhoven (2004), and Jannedy (this volume). Since pitch variations are in general perceived as tone, it is not always trivial to differentiate (pitch) accents from tones, even more since many languages have both, accent and tone (cf. Downing 2004, and discussion in the next section).²

Intonation languages use pitch accents as the principal means of focusing.³ Note that I do not discuss the principles that govern pitch accent placement within the focused constituent in this article, but see e.g. Selkirk (1984, 1995) and Uhmann (1991). In all intonation languages I am aware of, the basic shape of the pitch accent that marks a focus is an H*+L falling tone, where the * marks the tone on the stressed syllable. Given the general interpretation of this tone as involving “a

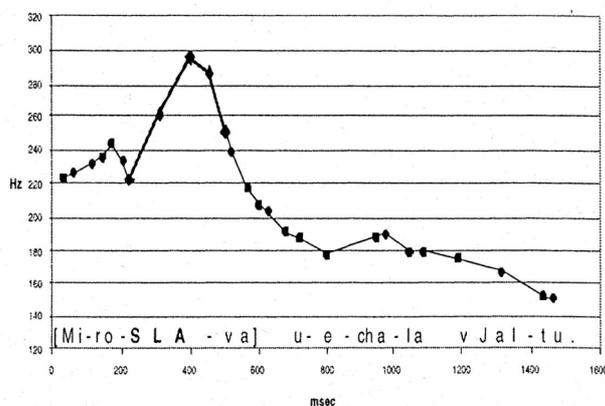
² The typological classification of languages concerning stress and accent is not consistent in the literature. Some phonologists consider *accent languages* as being subtypes of tone languages in having lexical tones with a contrastive function only to a very limited extent (e.g. Yip 2002). Others define accent languages as identical to what I call here *intonation language* (e.g. Hall 2000).

³ Apart from pitch accents, the focused constituent can be marked by additional grammatical means, such as displacement. In German, for instance, the focused constituent can be fronted. Note that the fronted focused constituent has to be associated with a pitch accent.

sense of finality, or completeness, definiteness, and separateness when used with declaratives” (Cruttenden 1986:100), the preference for the H*+L tone as a focal pitch accent becomes obvious. Another very general property of focus intonation is the drop in pitch after the H*+L accent. The postfocal contour is deaccented, probably due the low boundary tone at the end of the clause. These properties of focal intonation are illustrated in the following pitch track from Richter & Mehlhorn (2006:357). (3) is a Russian sentence with (contrastive) subject focus, and (4) is the corresponding pitch track.

- (3) MIROSLAVA uechala v Jaltu.
 M. left for Jalta
 ‘It is Miroslava who left for Jalta.’

- (4) Intonation contour in a sentence with contrastive subject focus (Richter & Mehlhorn 2006)



The pitch track above illustrates quite clearly the association of the most prominent syllable of the subject *sla* with the high tone and the following low trail tone. It also shows deaccentuation of the postfocal material.

It is clear that the format of this article does not allow the clarification of all issues of focal tone in intonation languages. The aim of the present section was to show that intonation languages use tone to indicate information structure.

In addition, it seems that there is not much variation with respect to the major parameters of focus marking by pitch accents in intonation languages.

4 Focal Intonation in Tone Languages

The last section illustrated the main function of tone in intonation languages: Tone as a result of pitch movement highlights the focused constituent in a clause. Thus, tone with contrastive function not only differentiates lexical meanings in tone languages, but also information structural categories in intonation languages. The present section takes an opposite perspective in showing that intonation also plays a role in tone languages when it comes to focus marking.

It is expected that tone languages do not use a fixed H*L pitch accent to mark a focus constituent, since lexical tones must be retrievable through the derivation of the clause. Their complete obliteration by an intonation pattern is therefore avoided. And indeed, tone languages seem to use intonation to a much lesser extent for focus marking than intonation languages (cf. Cruttenden 1986:80). Still, some intonation effects of focus can be observed in tone languages as well. The following sections discuss f_0 -expansion and prosodic rephrasing in turn. It is shown how the lexical tone melody is recovered under modification by intonation. Thus, the pragmatic meaning (from intonation) does not obscure the lexical meaning (from tone).

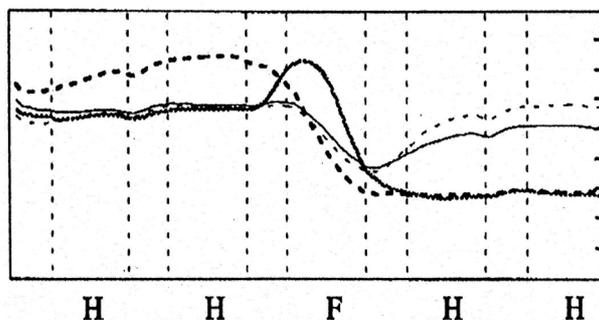
4.1 F_0 -expansion

A first intonation strategy to mark a focused constituent in tone languages is the expansion of the f_0 -contour. As an effect of f_0 -expansion, the high points of the tones are raised, and the low points are lowered. F_0 -expansion does not change the general course of intonation, but results in a more defined shape of the intonation contour.

Xu (1999) discusses effects of focusing in Mandarin Chinese, a tone language with four contrastive tones. Xu (1999) shows that focus influences the f_0 -contour in Mandarin declarative clauses: The f_0 -contour on the focused (in situ) constituent is expanded. Thus, the high tones are realized with a higher pitch, and the low points with a lower pitch. The expansion is significant on non-final focused words. On final focus words, however, the increase is much smaller. Much as in intonation languages, the f_0 -contour of a post-focal tone is considerably suppressed. Xu examines three-word declarative clauses with minimal lexical variation, which at the same time exhibit a large number of tonal combinations. The pitch track in (6), from Xu (1999:64), illustrates the sentence in (5), an example consisting of two bisyllabic words with high level tones (H) and one monosyllabic word with a high falling tone (F), under various focus conditions.

- (5) H H F H H
 | | | | |
 māomī mài māomī
 kitty sells kitty
 ‘Kitty sells kitty.’

- (6) Effects of focus on a f_0 curve. Normal line: neutral focus, broken line: focus on word 1, bold line: focus on word 2, dotted line: focus on word 3 (Xu 1999:64)



The pitch track shows that the f_0 -contour of the focused constituent is expanded. Comparing the curve of the neutral focus clause with narrow foci on the first, second, and third word, respectively, it is clearly visible that the pitch is significantly raised on the focused words.

Pitch expansion of the focus constituent is also attested in Hausa, a genetically unrelated language. Leben, Inkelas & Cobler (1989) discuss a process of *local high raising* ‘where a single High tone on an individual word is raised to highlight that word’ (Leben, Inkelas & Cobler 1989:46). High raising occurs on focus constituents in the left periphery of the clause, i.e. subject foci and ex situ non-subject foci. Example (7) with subject focus is taken from their article, high raising is indicated by an upwards directed arrow:

- (7) Maalàm ↑Nuhù nee / ya hanà Lawàn / hiir[á] dà Hàwwa.
 Mister N. PRT 3sg.PERF prevent L. chat with H.
 ‘It was Mister Nuhu / who prevented Lawan / from chatting with
 Hawwa.’

The comparison of the phonetic realization of the focused subject and backgrounded subject shows that the high tone of the name *Nuhù* is produced much higher if the subject is focused. Notice that, in addition to high raising, a focused constituent in the left periphery is also separated from the rest of the clause by a prosodic boundary (cf. again Leben, Inkelas and Cobler 1989). This prosodic boundary effects a suspension of downdrift, i.e. the lowering of an H tone after an overt L tone, which typically determines the intonation structure of Hausa declarative sentences (cf. Newman 2000).⁴ Note that a focused

⁴ It must be noted that ex situ focus in Hausa is not uniquely marked by prosodic means. In addition, there are syntactic and morphological effects of ex situ focus marking: First, non-subject ex situ focus is indicated by syntactic reordering. Second, ex situ focus is

constituent does not have to be displaced, but can stay in its base-generated *in situ* position (cf. Jaggar 2001). The prosodic focus strategies discussed for Hausa *ex situ* focus do not apply to the cases of *in situ* focus: *In situ* focus in Hausa is generally unmarked (cf. Hartmann & Zimmermann, in press).

4.2 Prosodic rephrasing

A second strategy used by some tone languages to mark focus is the insertion of a prosodic boundary before, or in the vicinity of, the focused constituent. This is also an *intonation* strategy since the boundary is indicated tonally.

A tone language that marks focus by prosodic rephrasing is Nkhotakota Chichewa (Bantu, Kanerva 1990, Downing 2006). The examples in (8) show that the expression of focus affects the prosodic phrasing of the Chichewa clause: The focus constituent must end a phonological phrase as indicated by lengthening of the penultimate syllable and tone lowering on the phrase-final vowel (phrase boundaries are indicated by brackets):

- (8) a. What did he do? *VP focus*
anaményá nyumbá ndí mwáála
 he.hit house with rock
 ‘He hit the house with a rock.’
- b. What did he hit with the rock? *OBJ focus*
 (anaményá nyúmba) (ndí mwáála)
- c. What did he do to the house with the rock? *V focus*
 (anaménya) (nyúmba) (ndí mwáála)

If the VP is focused as in (8a), the whole VP forms a prosodic unit. Narrow focus on either the object (8b) or the verb (8c) effects a prosodic phrase

accompanied by a morphological change in the perfective and imperfective aspectual markers. Third, *ex situ* foci are optionally followed by a focus sensitive particle.

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- (10)Q: Áudu mad-gó/*mad-ug náŋ? A: Áudu mad-gó/*mad-ug líttáfi.
 A. read-PERF what A. read-PERF book
 ‘What did Audu read?’ ‘Audu read A BOOK.’

In the wh-question as well as in the corresponding answer in (10), neither VE nor LDD applies. The verb *madgó* still associates with a high tone.

Focused subjects cannot stay in their canonical preverbal position but appear postverbally, compare (11):

- (11) a. [S Malay [VP múdúd-gó]] *neutral*
 M. die-PERF
 ‘Malay died.’
- b. [S t₁ múdúd-gó] nóŋ₁? *SUBJ-focus*
 die-PERF who
 ‘Who died?’

(11b) shows that VE and LDD are also blocked on the verb if followed by a focused subject in postverbal position. This could be taken as an indication that the postverbal position is the canonical focus position in Tangale. It also shows that the focused constituent must form its own prosodic phrase, see Hartmann & Zimmermann (2006) for further discussion.

5 Conclusion

The intension of the present article was to clarify the notion of tone as an indication of focus. The article took two perspectives. First, it looked at tonal realizations of focus in intonation languages, where focus is obligatorily marked by pitch accents. Second, it investigated two intonation strategies of focusing in tone languages, f_0 -expansion and prosodic rephrasing. It is interesting to note, though, that intonation focus strategies are scarce in tone languages. Rather, tone languages prefer to resort to morphological and/or syntactic strategies of focus

marking. This result meets our expectation that intonation tone and lexical tone are not easily compatible. I hope that the present article helped to disentangle the complex interaction of focus and tone in different language types.

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