Accenting phenomena, association with focus, and the recursiveness of focus-ground*

Enric Vallduví[†] and Ron Zacharski[‡]
Human Communication Research Centre[†],
Centre for Cognitive Science[†], and Department of Linguistics[‡]
University of Edinburgh

1 Introduction

In an attempt to systematize and generalize the phenomena referred to as 'association with focus', a number of recent papers have argued that the quantificational structure of so-called focus-sensitive operators is crucially determined by the traditional pragmatic focus-ground partition. Research in this area has concentrated on providing a semantic description of focus-ground and then defining the semantics of focus-sensitive operators in terms of the semantics of focus-ground. In other words, focus-sensitive operators take as arguments semantic objects that are structured in accordance with an independent focus-ground partition. From this perspective, one needs to assume that sentences with more than one focus-sensitive operator contain multiple focus-ground partitions (overlapping or recursive) within a simplex sentence, something which is at odds with the traditional view of focus-ground.

This paper argues that focus-ground does not necessarily determine the quantificational structure of focus-sensitive operators. It shows that these operators may express their semantics on partitions other than the focus-ground partition. This means that recursive or overlapping focus-ground partitions are not required in sentences with more than one focus-sensitive operator. The belief that more than one focus-ground partition per sentence may be available appears to rest in part on the assumption that every pitch accent is correlated with a focus in a focus-ground partition. Since sentences may have more than one pitch accent, that means they contain more than one focus. This assumption, however, is unwarranted. Accenting is used as a structural resource in natural language for a number of different reasons. It is shown below that there is no one-to-one correspondence between accent and focus and between accent and an 'operator-associated' element.

2 Background

Let us first introduce some background notions and terminology concerning focus-ground, accent, and association with focus. The term 'focus' has (at

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least) three uses: a phonological one, a semantic one, and a pragmatic one. Clarification of the three uses of 'focus' is important in approaching the issues raised below.

2.1 Focus-ground

Focus-ground is found, under a number of different names and guises (e.g. focus-presupposition, theme-rheme, topic-comment, dominance), in a wide variety of works in the pragmatic and discourse-analytic literature (see Hockett 1958, Kuno 1972, Gundel 1974, Erteschik-Shir 1986, Prince 1986, Rochemont 1986, Ward 1988, among others). There are significant differences between these approaches, but they all share the view that focus-ground is an expression of the structuring of sentences according to informational or communicative requirements, i.e. it indicates how information conveyed by linguistic means is added to a (hearer's mental model of the) context or discourse. The focus constitutes actual information and the ground is what anchors this information to the context.

There is a wealth of characterizations of focus-ground, but, for expository purposes, let us settle on the following definitions adapted from Vallduví 1992. Let ϕ_s be the proposition conveyed by a sentence S and K_h (the relevant subset of) the hearer's model of the common ground at the time of utterance (t_u). The focus and ground can be defined thus:

- FOCUS: the part of the sentence that encodes *information* (I_s), i.e. the only augmentation or modification to be made to the hearer's model of the common ground (the update potential of ϕ_s in a particular context).
- GROUND: what is already established in the hearer's model at t_u; it ushers I_s to the right location (from the speaker's viewpoint) in the hearer's model.

If one adopts a Heimian file-like view of the context (Heim 1982) and K_h is thought of as a file F_1, then the function of the ground consists in ushering I_s to a particular file card and to a particular record on that file card which I_s is meant to augment or modify. If I_s can be appropriately added to F_1 without ushering, i.e. if specification of a file card and/or record is inherited from a previous utterance, no explicit ground is needed and an all-focus sentence may occur.[1]

Let us illustrate focus-ground with some examples adapted from Jackendoff (1972:248). In (1) the focus of an assertion is identified using the well-known, although not infallible, question test: the focus of the answer corresponds to the wh-phrase in the question.

[1]Vallduví 1992 argues that the informational or communicative structuring of sentences serves to optimize the process of information update. To this purpose, a sentence S encodes not only a proposition ϕ_s but also an **instruction** that indicates how I_s is best added to K_h in the terms just outlined. There are four possible instruction-types and each is the result of different combinations of focus and ground. Focus-ground is defined so as to encompass both the traditional focus-ground and topic-comment partitions in one single articulation. See Vallduví 1992 for further discussion.

(1) a. What did John do?
John [$_F$ gave his daughter a new BICYCLE].

b. What did John give his daughter?
John gave his daughter [$_F$ a new BICYCLE].

c. Who did John give a new bicycle?
John gave [$_F$ his DAUGHTER] a new bicycle.

d. Why don't we drive there?
[$_F$ The ROAD's dangerous.]

In these sentences focus is delimited by the F-labelled square brackets. Small caps identify the word receiving nuclear stress. In sentence (1a) the focus is the VP, (1b) shows a narrow focus on the direct object, and (1c) a narrow focus on the indirect object. These three sentences are truth-conditionally equivalent and differ only in their focus-ground structure. Sentence (1d) is a thetic all-focus sentence (see Lambrecht 1987 and Sasse 1987 for theticity).

Speaking of recursive focus-ground structures within a simplex sentence has little conceptual motivation from the informational or communicative perspective. It is unclear what it would mean to say, for example, that within the part of the sentence that ushers I_s, call it G, there is a second I_G with its own ushering ground. Simplex sentences have only one top-level (informational) focus-ground structure that determines what part of the sentence encodes their update potential and what part acts as an usher. Finally, let us note that the structural realization of focus-ground is subject to crosslinguistic variation. English, as shown in (1), tends to resort to prosodic contrasts to express differences in focus-ground structure. Other languages, like Catalan or Hungarian, must resort to syntactic means to express the exact same differences.

2.2 Association with focus

Jackendoff 1972, among others, notices that sentences (1a-c) cease to be truth-conditionally equivalent in the presence of some operators like *even* and *only*:

(2) a. John even [$_F$ gave his daughter a new BICYCLE].

b. John even gave his daughter [$_F$ a new BICYCLE].

c. John even gave [$_F$ his DAUGHTER] a new bicycle.

The VP-external adverb *even* in (2a-c) is interpreted as being construed with, i.e. as associating with, the constituents enclosed in brackets. Having identified the bracketed constituents as foci, Jackendoff concludes that *even* associates with focus, with the pertinent truth-conditional effects. Since then, *even* and *only* have been known as focus particles or focus-sensitive operators.

Jacobs 1984, 1991 is a reformulation of the association-with-focus phenomenon. Jacobs argues that the pragmatic focus-ground partition discussed in § 2.1 is in fact the argument of an implicit illocutionary operator. In declaratives the illocutionary operator is ASSERT. Jacobs' view of the communicative import of focus-ground is not unlike Vallduví's (1992) in that he takes focus to be the element that represents the only augmentation of the context (what he calls the focus of the assertion). When ASSERT takes the focus-ground partition in (1b) as an argument, it yields the interpretation that, given a context where John gave his daughter something, the speaker asserts it is a bicycle. This is represented in (3a):

(3) a. ASSERT(John gave his daughter [$_F$ a new BICYCLE])

b. ASSERT(EVEN(John gave his daughter [$_F$ a new BICYCLE]))

Given the focus-ground partition used by ASSERT, *even* can parasitize on it and use the structure it provides to express its meaning, as in (3b). Both (3a) and (3b) have the same structure, but in (3a) the focus-ground partition remains truth-conditionally inert whereas in (3b) the partition is exploited not only by the original illocutionary operator but also by a logico-semantic operator, thus giving rise to truth-conditional effects. In addition to *even* and *only*, quantificational adverbs, negation, modals, and other elements have also been observed to be capable of associating with focus.

2.3 Quantificational partition

Recently, a stronger and more general approach to association with focus has evolved. The focus-ground partition is not a pragmatically motivated notion anymore, but rather its primary function is to provide a quantificational structure for the use of focus-sensitive operators. The communicative use of focus-ground is merely one of the uses this quantificational structure has. Jacobs' ASSERT operator is merely another focus-sensitive operator, without any special status. The exact characterization of the quantificational structure that focus-ground provides varies from work to work. Following work by von Stechow (1981, 1991), Krifka 1991-92 suggests that focus-ground provides a structured meaning ($< \alpha, \beta >$), which in later work (Krifka 1992, 1993) he equates to the <RESTRICTOR, NUCLEUS> partition of quantification structures that Partee 1991 defends. In contrast, for Rooth 1985, 1992, focus on an element x provides a set of alternatives for x (ALT(x)) which determines the domain of quantification for the operator that associates with x. Given this view of focus-ground, it is imperative that focus-sensitive operators undergo association with focus, since they crucially depend on the structure provided by focus-ground to express their meaning.

This view of focus-ground has important consequences in examples like (4):

(4) a. Even [$_F$ JOHN] drank only [$_F$ WATER].

b. John even [$_F$ only [$_F$ drank WATER]]

These sentences, from Krifka 1991-92, have more than one focus-sensitive operator. Viewing association with focus as a mere tendency, the examples in (4) are quite uninteresting. Perhaps one operator does associate with focus (i.e. is parasitic on ASSERT), but the other operator associates with some other element in the sentence. But if we assume that focus-sensitive operators crucially depend on the structure provided by focus-ground to be able to express their meaning, we must conclude that these sentences have more than one focus-ground partition, as represented by the labelled bracketing.

As noted above, this presumption is the main concern of this paper. We argue that focus-ground is primarily an informational or communicative (or illocutionary) notion, which can be parasitized on by focus-sensitive operators. However, the presence of more than one of these operators does not entail the existence of more than one focus-ground partition, since focus-sensitive operators may associate with elements other than foci.

2.4 Pitch accent

Before moving on to the main body of the paper, a word about pitch accent and the phonological use of the word ‘focus’.

Following the models of prosodic phonology in Pierrehumbert 1980 and Pierrehumbert & Hirschberg 1990, and Ladd 1980, 1988, 1990, we take perceived prominence to be correlated with pitch accent. A pitch accent is a simplex or complex tone—there are up to six types in Pierrehumbert’s theory—associated with a stressed syllable. Sentences consist of one or more intonational phrases and each phrase has a single most prominent pitch accent, which is called the nucleus or ‘focus’. Thus, a single sentence may contain multiple prosodic foci.

This multiplicity of pitch accents (for the sake of clarity, we will refrain from using the term ‘prosodic focus’) is illustrated in the text in (5). All the items in small caps in (5) were associated with a pitch accent when the text was read out loud by an informant:

(5) It would have been unusual if Catherine Malfilano had NOT become involved somehow in THEATER and MUSIC, considering that her FATHER is a VIOLINIST in the orchestra at the Met and her MOTHER, a DANCER, was a member of the Met’s BALLET company. (*The Opera 1992*, J. Ryder, 1991)

This text also illustrates two accent types that will be of special relevance in the discussion below: Jackendoff’s (1972) A accent and B accent. *Father* and *mother* are associated with a B accent and *violinist* and *ballet* are associated with an A accent. In Pierrehumbert’s terms, the A accent corresponds to a simplex H* tone (generally followed by an L boundary tone), whereas the B accent corresponds to a complex L+H* fall-rise (Pierrehumbert (1980:35) expresses some reservations about identifying Jackendoff’s B accent to L+H*, but in Pierrehumbert & Hirschberg (1990:296-7) these reservations are overcome). The contour formed by an L+H* followed by an H*(L) has been called the ‘suspension bridge contour’ (Bolinger 1961) and the ‘hat pattern’ (Cohen & ’t Hart 1967). The B accent is generally not correlated with a focus in a focus-ground partition. Nevertheless, it will be shown that focus-sensitive particles may associate with a B-accented item.[2]

[2]Focal fall-rise accents do occur in contexts in which speakers wish to convey uncertainty. Consider (i), from Ward and Hirschberg (1985:774) (\/ enclose the item associated with the fall-rise accent):

(i) a. Do you have jello?
b. We have \PIE/.

The fall-rise in (ib) conveys uncertainty about whether some sweet other than jello, i.e. pie, is

3 Claims

We are now in a position to review the assumptions and the claims about focus made in the literature on association with focus. This claims concern the three notions of focus mentioned above and the relations that exist between them: how are phonological pitch accents, semantic nuclei in a nucleus-restrictor structure, and pragmatic foci in a focus-ground partition related? It must be noted that some of these claims are made implicitly rather than explicitly when a distinction fails to be made. These claims are summarized in Figure 1 and listed in (6):

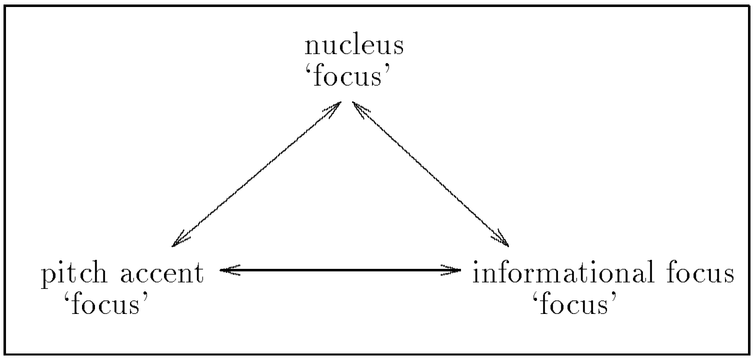

Figure 1: **Claims**

(6) a. If x is a nucleus, then x is [+pitch accent].
b. Every pitch accent is correlated with a nucleus.
c. If x is an info focus, then x is [+pitch accent].
d. Every pitch accent is correlated with an info focus.
e. If x is a nucleus, then x is info focus.
f. If x is an info focus, then x is a potential nucleus.

In what follows each one of these claims and assumptions will be examined. First, the relationship between pitch accents and quantificational nuclei will be considered (left hand side of Figure 1). Then, we will show and discuss examples of nonfocal pitch accents, i.e. accents associated with an element in the ground, and to accents associated with a nonstandard subsegment of the focus (bottom of Figure 1). Finally, the implication that quantificational nuclei are necessarily foci in a focus-ground partition will be countered (right hand side of Figure 1). After due consideration of all the evidence, it seems that the only implications that can be maintained are those in (6′):

of interest to the querier. The fall-rise associated with uncertainty, however, is not a B accent; it is not an L+H* but rather an L*+H (Ward and Hirschberg 1985:750). Apparently, when a focal accent and an uncertainty accent compete for the same structural slot, the latter takes preeminence over the former. In addition, Pierrehumbert & Hirschberg (1990:296-7) mention some examples where focus appears to be associated with an L+H* accent. It is unclear to us what the semantic value of this type of focal accent is, although Pierrehumbert & Hirschberg talk about 'correction'.

(6′) c. If x is an info focus, then x is [+pitch accent].

f. If x is an info focus, then x is a potential nucleus.

Implication (f) is a weak implication, in that it entails the nonidentity of foci and nuclei. This is precisely the position defended here: the arguments in this paper suggest that while nuclei may be foci, they may be part of the ground as well. Implication (c) is quite uncontroversial and has actually been heralded as a universal (e.g. Sgall *et al.* 1986, Lambrecht 1987). It seems to hold both for languages that realize focus largely by phonological means and for languages that do it largely syntactically. In the former language type, nuclear stress may shift to different positions in the clause to associate with different focus assignments, while the syntactic structure remains constant. In the latter type, the intonational structure remains constant and syntactic operations are needed to bring the focal constituent and the nonshifting nuclear stress together.[3]

4 Pitch accents and nuclei

This section examines the nature of the relationship between pitch accent and quantificational nuclei, i.e. claims (a) and (b) in (6).

4.1 Nucleus ⟶ [+pitch accent]

In standard cases of association with focus, differences in the placement of nuclear stress appear to be correlated with different <RESTRICTOR, NUCLEUS> structures. Sentences (7a) and (7b) differ not only prosodically but also in their truth value. In their default readings, (7a) means that John introduced no one other than Bill to Sue and (7b) that John introduced Bill to no one but Sue. In other words, *Bill* is the quantificational nucleus in (7a) and *Sue* is the quantificational nucleus in (7b):

(7) a. John only introduced BILL to Sue.

b. John only introduced Bill to SUE.

It is readily observable that in both cases the quantificational nucleus is realized with nuclear stress. The claim that nuclei must be spelled out by a pitch accent is quite standard in the semantic literature on association with focus, as illustrated by the following two quotes:

> 'Thus a pitch accent is the phonological interpretation of the focus feature.' (Rooth 1985:19)
>
> 'In phonology, the focus feature is spelled out by sentence accent.' (Krifka 1991:17)

[3]It is unclear whether the validity of (6c) extends to languages like Navajo (Schauber 1978), which realize focus-ground morphologically. Japanese, which makes at least partial use of morphology to realize focus-ground, appears to have some prosodic manifestation of focus, although focal accents in Japanese are less distinguishable than their English counterparts (see Lambrecht 1987:380).

The fact that both these quotes use the term 'focus' to denote a nucleus is potentially confusing, but it is clear they refer to a nucleus in a quantificational <RESTRICTOR, NUCLEUS> partition, since for both Krifka and Rooth the location of the nucleus is determined by the presence of a focus feature.

There are some immediate problems for the implication that a nucleus must be correlated with a pitch accent. Sentences where the nucleus does not receive a pitch accent are, in fact, not deviant in any sense, given proper contextualization. Both Partee 1991 and Krifka 1992 notice this, but nevertheless decide to maintain the implication that nuclei are accented and suggest an explanation for the 'deviant' behavior of these nonaccented nuclei. Take examples (8) and (9), from Partee (1991:179) and Vallduví (1992:163), respectively:

(8) a. Eva only gave xerox copies to the GRAduate STUdents.
    b. (No,) PETR only gave xerox copies to the graduate students.

(9) a. Who always took JOHN to the movies?
    b. MARY always took John to the movies.

In (8b) the nucleus, i.e. the element associated with *only* is the unaccented *graduate students*. Likewise in (9b), where the element associated with *always* is the unaccented *John* (the meaning of (9b) is that at every time interval where Mary takes someone to the movies, she takes John to the movies). Nuclear stress in both (8b) and (9b) is associated with the pragmatic foci of these sentence, not with the nuclei of the focus-sensitive operators they contain.

Both Partee and Krifka argue that the associated nuclei in (8b) and (9b) are foci. Thus, (8b) and (9b) are sentences with two analogous foci: one of them is associated with an overt semantic operator, the other is associated with an implicit pragmatic CONTRAST operator, for Partee, or an ASSERT operator, for Krifka. To account for the fact that the nuclei *graduate students* in (8b) and *John* in (9b) are not associated with a pitch accent, Krifka (1992:233), commenting on an example practically identical to (9b), stipulates that, in sentences with more than one (pragmatic or semantic) focus-sensitive operator, it is always the nucleus associated with the highest operator which is realized with nuclear stress. In (9b) the illocutionary operator ASSERT (see discussion of Jacobs 1984, 1991 in § 2.2) is higher than the quantificational adverb and, therefore, accent is associated with the nucleus of the former. Presumably, the same analysis can be given for examples like (10) (Krifka 1991-1992:22), where the nucleus of the lower operator is unaccented:

(10) [Most people drank water at some time during yesterday's party.]
     John even$_1$ drank [$_{F1}$ ONLY$_2$] [$_{F2}$ water].

The reason for expecting nuclei to be always accented rests on the assumption that nuclei are necessarily foci. Since foci are uncontroversially thought of as being always realized with nuclear stress, nuclei should too. If, however, nuclei are not identified with foci, the lack of a pitch accent on the nuclei in (8b) and (9b) ceases to be a problem. In fact, as elements within the pragmatic ground of (8b) and (9b), the lack of accent on these nuclei is not unexpected at all.

Sentences (8b) and (9b), then, contain unaccented nuclei that belong to the ground. It is also possible to encounter unaccented nuclei within a wide complex-category informational focus. Consider example (11), from Nevalainen (1987:148):

(11) [$_F$ There's only a month till CHRISTMAS now]

This sentence, as is the case with all canonical existential sentences (see Sasse 1987, Vallduví 1992) is an all-focus sentence with a null ground. The nuclear stress on *Christmas* is correlated with this informational focus. The nucleus of *only* in (11) is clearly *a month*. Nevalainen's data comes from a corpus of speech carefully coded for prosody. Nevalainen's transcription reveals that *a month* is realized with no accompanying pitch accent. In fact, the only pitch accent in this sentence is the one on *Christmas*, which as expected marks informational focushood. It is worth mentioning that a full 10% of the nuclei in Nevalainen's corpus are, like the nucleus in (11), realized with no pitch accent whatsoever.

Thus, we must reject claim (a) above. It is simply not the case that nuclei must be phonologically marked with a pitch accent. Krifka's (1992) stipulation that only the nucleus associated with the highest operator is accented appears to provide an escape hatch, but a counterexample will be discussed in § 6.

4.2 [+pitch accent] ⟶ nucleus

The assumption that every pitch accent is (partially) correlated with a nucleus is manifest in examples like (12), from Rooth (1992:80):

(12) In [$_F$ MY] opinion, in the [$_F$ OLD] days, in [$_F$ THIS] country...

Rooth 1992 argues that all the pitch accents in (12) are pragmatic foci associated with an F feature that gives rise to a set of alternatives used, in this case, merely for contrast. Calling all the accented items in (12) foci is stretching the notion of informational focus excessively, although it may be the case that they are nuclei associated with some abstract 'contrast' operator. Still, although it may be argued that all the accented items in (12) are contrastive, it is not entirely clear that all pitch accents are connected with a contrastive interpretation. Take example (13):

(13) That Ann—she's such an INteresting PERson.
She dances the taranTELla with a PASsion;
she grew up in SOUTH DaKOta,
and she studied classical ChiNESE at HARvard.

The informational focus in each of the four sentences in (13) is the verb phrase. In the last of these sentences, despite the fact that the pitch accent on *Harvard* suffices as an expressor of (pragmatic) focushood, the pitch accent on *Chinese* is obligatory. What motivates the pitch accent on *Chinese*? *Chinese* is clearly not the nucleus of any overt operator (there is none), nor it seems feasible to suggest that there is some 'abstract' contrast operator associating with it. In the context of (13) there is no explicit contrast between (classical) Chinese and any other language.[4]

[4]Of course, (classical) Chinese stands in contrast with, let us say, other members of the set of languages that can be studied in an American university. However, this contrast is not any

The actual reason for the presence of the pitch accent on *Chinese* is hard to pin down. Most likely, it has nothing to do with focus-ground, quantificational nuclei, or contrast. Bolinger (1989:357) argues that words are accented if they are informative and interesting. Zacharski 1993, where this notion of informativeness or interestingness is pursued, points out that items than depart from some semantic or cultural stereotype, attract phrasal accentuation. If we replace *Classical Chinese* with something that is relatively uninteresting, the accentuation changes. None of the direct object NPs in (14) requires association with a pitch accent:

(14) a. She took courses at HARvard.

b. She studied English at HARvard.

c. She got a degree from HARvard.

In addition to this interestingness dimension, there are metalinguistic and emotive factors involved in accent determination. Marked accenting patterns may be used to carry out metalinguistic corrections even in languages that do not have a flexible intonation contour like Catalan and Hungarian (see Vallduví 1992). Pitch accents on certain structural positions can also be used to express solidarity (McLemore 1991) or to assist in the choreography of discourse, e.g. getting the floor, using turn-taking devices, beginning and ending a topic or discourse (Lehman 1977).

Accent placement in English is determined by a number of different independent factors, which include focushood (as in focus-ground), interestingness or informativeness, emotiveness, and others. In addition, as we will see below in § 5.2, English uses yet another (de)accenting strategy to express givenness or repetition of an item. In sum, there is no simple one-to-one relationship between semantics or pragmatics and the location of pitch accents.

Before moving on to other claims in (6), a qualification is in order. It is not the case that every pitch accent must constitute by itself a quantificational nucleus. Sometimes two pitch accents may correspond to a single complex-nucleus. This occur in examples like (15), from Krifka (1991-92:21):

(15) John only introduced BILL to SUE.

In (15) *Bill* and *Sue* from, as a pair, one single nucleus. Rooth (1985:60) describes the meaning of (15) as 'if John has the property of the form 'introduce x to y', then it is the property 'introduce Bill to Sue'. It is because of examples like this that one must say that every pitch accent is *partially* correlated with a nucleus.

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more explicit here than the contrast that would arise from the unaccented constituents in (i):

(i) The middle-income woman bought the average-sized PICK-UP.

Evidently, unaccented *the middle-income woman* stands in contrast with women of other income brackets, although such contrast remains latent (or as latent as the contrast on *Chinese* in (13)).

5 Pitch accents and foci

5.1 [+pitch accent] ⟶ info focus

Let us move to the bottom half of Figure 1 and discuss implication (6d), i.e. the claim that pitch accents must be informational foci. In § 4.2 it was pointed out that some pitch accents appear to be unrelated to focus-ground structure, which, if correct, is an obstacle to the truth of (6d). The claim, however, does not hold even if we restrict our attention to information structure: pitch accents may appear within the ground of a focus-ground structure.

There is ample reference to this fact in the literature. Bardovi-Harlig 1983 emphasizes that the claim that ground elements must be unaccented is empirically unmotivated and cites examples from over a dozen sources. Bolinger (1986:47) states that 'since theme and rheme [= ground and focus] are fundamental to the meaning of the utterance, each is separately highlighted'. Jackendoff 1972 points out that 'topics', which appear within the ground in focus-ground partitions are associated with a fall-rise accent (B accent) and notes that topicalized elements (not focus-preposed elements) are always associated with such an accent. Finally, Steedman 1991 clearly treats L+H*-accented items as being part of the ground, which he calls theme.

It is not every item within the ground that is amenable to accenting. The L+H* or fall-rise accents we have been discussing here are associated with a specific ground element which is generally referred to as (shifted) topic, anchor, or link (see Jackendoff 1972, Gundel 1974, Ronat 1979, among others). In Vallduví's (1992) system, briefly discussed in § 2.1, this element is called link and this is the term we will use here. As noted, the function of the ground is to usher I_s to the right location in the hearer's model of the common ground (F_1). The ground is articulated into two parts: link and tail. Each performs a particular task within the general ushering function of the ground.[5]

Ann and *Clara* in (16) are typical subject links. They are associated with an accent, although they are part of the ground in any traditional pragmatic sense of the word. The foci in the answers to the question in (16) are the direct objects:

(16) What are people wearing to the concert?
Well, [$_{L}$ ANN] is wearing [$_{F}$ a black PANT suit]
and [$_{L}$ CLARA] is wearing [$_{F}$ a long black DRESS.]

When links are nonsubjects, there are two strategies to express linkhood. One is syntactic: the link XP may be fronted in a topicalization configuration. The other is purely prosodic: a link phrase may be left in situ and marked with an L+H* accent. This two strategies are illustrated in (17) and (18) respectively, where *this drawer* and *that one* are realized as links:

[5] Suffice it to say here that links designate a file card *fc* in F_1 (the hearer's model of the common ground) as the locus of information update with I_s. As noted in § 2.1, *fc* for S_n may be inherited from S_{n-1}, in which case no link is necessary. Tails, on the other hand, designate a given record R (a relation or attribute) already listed on *fc*. If a tail is present in the ground, I_s updates F_1 by completing or altering R.

(17) What about the drawers? What do you keep in them?
In [$_L$ THAT drawer] I keep [$_F$ my SOCKS]
and in [$_L$ THIS one] I keep [$_F$ my SHIRTS.]

(18) What about the drawers? What do you keep in them?
I keep [$_F$ my SOCKS] in [$_L$ THAT drawer]
and [$_F$ my SHIRTS] in [$_L$ THIS one.]

The fact that *this drawer* and *that one* in (18) appear in sentence final position and are associated with a pitch accent should not lead us to think they are foci. The pitch accent associated with them is L+H* and the total information-structure equivalence of (17) and (18) show they are not foci but links.[6]

At this point it is interesting to compare English to Catalan, since Catalan is a language that does not allow realization of linkhood by prosodic means. In Catalan, all links must be topicalized. Example (19) is the equivalent of English (16), and (20) is the only equivalent of both (17) and (18), since (21) is an infelicitous sequence:[7]

(19) Què es posaran, per anar al concert?
[$_L$ L'Anna$_1$] es posarà [$_F$ un tern NEGRE] t$_1$.
i [$_L$ la Clara$_1$] es posarà [$_F$ un vestit de gala NEGRE] t$_1$.
'What will they wear to the concert?
'Anna will wear a black suit and Clara will wear a long black dress.'

(20) I als calaixos què hi guardes?
En [$_L$ aquest CALAIX$_1$] hi$_1$ guardo [$_F$ els MITJONS]
i en [$_L$ aquell CALAIX$_1$] hi$_1$ guardo [$_F$ les SAMARRETES.]
'And the drawers, what do you keep in them?
In that drawer I keep my socks and in this drawer I keep my shirts.'

(21) # I als calaixos què hi guardes?
Guardo [$_F$ els MITJONS] en [$_L$ aquest CALAIX]
i [$_F$ les SAMARRETES] en [$_L$ aquell CALAIX.]

For whatever reason Catalan does not exploit intonational resources as much as English does. Rather it must resort to syntax to express focus-ground structure. In languages like Catalan failure to distinguish between link and focus is less likely to happen, since their structural realizations are so drastically different. In English and German, however, where both may be realized exclusively by means of pitch accent, we must be careful not to treat the two elements in the same way. In these languages, a pitch accent need not be associated with a focus, but rather may be associated with a subpart of the ground, i.e. the link.

[6] It must be noted that the prosodic difference that generally exists between links and foci in English appears to be entirely optional in languages like German. Féry 1992 shows that in German either an L+H* accent and an H*(L) falling accent may be used to realize linkhood. This second accent is phonologically identical to the pitch accent used for the realization of focushood.

[7] As can be deduced from the position of the subject traces in (19), Catalan is taken to be underlyingly VOS (see Solà 1992, Vallduví 1993).

5.2 Info focus ⟶ [+pitch accent]

This implication is generally viewed as uncontroversial: foci are associated with a pitch accent. However, the exact identity of the focal constituent associated with this pitch accent has sometimes been mistaken. The exact placement, within a focal constituent, of the focal pitch accent may be the result of the interaction of a number of independent processes. Consider Clara's response in (22b):

(22) a. Ann: What did you get Ben for Christmas?
Clara: I got him [$_F$ a blue SHIRT.]

b. Ann: What did you get Diane?
Clara: I got her [$_F$ a RED shirt.]

In Clara's response in (22b), nuclear stress is associated with the lexical item *red*. Often, *red* is taken to be the pragmatic focus of this sentence as well. However, as the question contextualization shows, the focus is not *red* but rather *a red shirt*. Whereas the placement of a pitch accent on the focal constituent is indeed a correlate of focus-ground structure, the exact location of that accent within this focal constituent is determined not by focus-ground structure, but rather by an independent process of deaccenting (see Ladd 1980, 1983). *Red* ends up with a pitch accent because *shirt* is deaccented. This deaccenting is triggered by the presence of the phrase *a blue shirt* in the answer in (22a). If (22a) were not present, the answer in (22b) would be realized with an accent on *shirt*. The reason d'être behind this deaccenting phenomenon is a matter of debate. One can appeal to some anaphoric device like concept-givenness (van Deemter 1992) or to the notion of informativeness (or interestingness) in Zacharski 1993: in the context of (22), the interesting or informative bit within the focus of the answer in (22b) is the fact that the shirt Clara got Diana is red, since this is the information that distinguishes this shirt from the one Clara gave to Ben.

Interestingly, the deaccenting strategy shown in (22b) is not available in all languages. In languages like Catalan and Italian, the factor that triggers deaccenting of *shirt* in (22b) is not at work, or perhaps manifests itself differently. Examples (23) and (24) are the Catalan and Italian equivalents of English (22) (the examples have been slightly modified to get around the fact that Catalan and Italian are NAdj instead of AdjN). In both (a) and (b), the focal pitch accent falls on the last accentable item within the focus constituent. The fact that in the (b) sentences this item has already been mentioned does not affect accent placement in the least:

(23) a. Anna: Què li vas regalar, al Benjamí, per Nadal?

Clara: Li vaig regalar [$_F$ una camisa NEGRA.]
iobj 1s-past-give a shirt black

'I got him a black shirt.'

b. Anna: I a la Diana, què li vas regalar?

Clara: Li vaig regalar [$_F$ uns pantalons NEGRES.]
'I got her black pants'

(24) a. Anna: Cosa hai regalato a Benjamin per Natale?
Clara: Gli ho regalato [$_F$ una camicia NERA.]
iobj 1s-past-give a shirt black
'I got him a black shirt.'

b. Anna: E cosa hai regalato a Diana?
Clara: Le ho regalato [$_F$ dei pantaloni NERI.]
'I got her black pants.'

The contrast between English on the one hand and Catalan and Italian on the other is quite striking. To get a full grasp of what English would look like without the deaccenting rule, or, equivalently, to see what Catalan and Italian do, it is illuminating to pretend that the dialogue in (25) is made up of grammatical sentences, i.e., that English is NAdj:

(25) a. Ann: What did you get Ben for Christmas?
Clara: I got him [$_F$ a shirt BLACK.]

b. # Ann: What did you get Diane?
Clara: I got her [$_F$ pants BLACK.]

If the sentences in (25) were grammatical, Clara's response in (25b) would clearly be infelicitous. Native speakers of English cringe at the thought that this sentence could be felicitous after the previous mention of *black* in (25a).

Accented items like *red* in (22b) are indeed correlated with a focus constituent, in this case *a red shirt*. They do not, however, constitute narrow foci by themselves. They are associated with a pitch accent simply as a result of the deaccenting of a neighboring item. Both a careful analysis of the English facts and a contrastive look at Catalan and Italian suggest that this is the right analysis for patterns like (22b). Therefore, assigning focus semantics or pragmatics to an item like *red* is an unmotivated step, despite the presence of a focal pitch accent on this item.[8]

6 Nucleus ⟶ info focus

Perhaps the most important claim found in the literature on association with focus under consideration is that all nuclei are foci in the traditional sense, i.e. foci in an informational focus-ground partition. This claim corresponds to implication (6e) and is reflected on the right hand side of Figure 1. Identifying

[8] Other (de)accenting effects interfere with the default mapping between focus-ground and prosody. Accenting constraints seem to play a role in the following contrast, noted by R. Ladd:

(i) [$_F$ JOHNSON died.]
(ii) * [$_F$ Former president JOHNSON died unexpectedly.]

Thetic all-focus utterances like (i) are realized in one prosodic phrase with the pitch accent associated with the subject. However, when the subject and the predicate are made 'heavier', as in (ii), inclusion of all the material within one phrase is impossible. The predicate must be associated with an additional pitch accent.

nuclei as foci is a necessity only if it believed that the quantificational structure of focus-sensitive operators is necessarily determined by focus-ground. This is view defended in, for example, Krifka 1991-92, 1992 and in Rooth 1985, 1992. From this standpoint, operators like *only* and *always* need to associate with a pragmatic focus because only focal constituents have the right semantics to act as their nuclei.

In this section we show that focus-sensitive operators may associate with elements other than a focus in a focus-ground partition. This mere possibility shows that nuclei with the kind of semantics required by operators like *only* become available through sources other than focus. First, we examine nuclei that are subsegments of the informational focus and then we discuss nuclei that are part of the ground.

6.1 Subfocal nuclei

Consider example (11) from § 4 again:

(11) [$_F$ There's only a month till CHRISTMAS now]

It was noted above that this is an all-focus example, where the nucleus of *only*, *a month*, is realized with no pitch accent. *A month* is clearly not the focus of (11), but rather a phrase within it. Nevertheless, it is capable of acting as a nucleus. Somehow, it provides the correct <RESTRICTOR, NUCLEUS> partition (or the required p-set) for *only*. Another case in point, although prosodically distinct, is (26b). Here, again, the nucleus is subfocal, but, unlike (11), it is associated with a pitch accent (the meaning of (26b) is that you will dream about your man but will do nothing else to him or with him):

(26) How will we relieve our libido?

a. Well, I will [$_F$ go to bed with my MAN],

b. but you'll [$_F$ only DREAM about YOURS].
. [H.B. in conversation (23/11/93)]

The focus in (26b) is not the verb *dream*, but rather the entire verb phrase, as the question contextualization and the parallelism with (26a) indicate. Nevertheless, *only* associates with *dream* without any difficulty, i.e. *dream* is able to act as nucleus despite the fact that it is not a focus on its own.

Of course, if it is assumed that there may be focus-ground partitions within the focus of a simplex sentence, then it could be claimed that *dream* is a focus within the larger verb-phrase focus. This idea, however, is not unproblematic. If *dream* were a focus one would expect it to be realized as such in all languages, independently of whether these languages use prosody or syntax in their structural treatment of focus-ground. But in Catalan, for instance, *dream* is not realized as a focus in the Catalan equivalent of (26). In Catalan, focal constituents are, as expected, associated with a pitch accent. Unlike English, however, Catalan cannot shift prominence along the sentence. Rather, prominence is necessarily associated with the right-hand boundary of the core clause. Therefore, a focal constituent must necessarily appear in core-clause-final position. If the focus-ground partition of a sentence is such that a narrow focus is required on the verb, all the elements that would otherwise appear to the right of the verb within the core-clause must be removed via left- or right-detachment. In the case at hand, for *dream* to be realized as focus, the prepositional phrase *about yours* would have to be detached. Example (27) is the Catalan equivalent of (26):

(27) Com ens ho farem, per satisfer el nostre desig sexual?
'What will we do to quench our sexual craving?'

a. Bé, jo [$_F$ me n'aniré al llit amb el meu HOME],
'Well, I will go to bed with my man,'

b. i tu [$_F$ només somniaràs amb el TEU].
'and you will only dream about yours.'

c. #i tu només hi$_1$ [$_F$ SOMNIARÀS,] amb el teu$_1$.

As shown in (27), this context allows the verb phrase *només somniaràs amb el teu* 'you'll only dream about yours' to be realized as focal, as in (27b). However, the use of the structure that would identify the verb *somniaràs* 'will dream' as focal is infelicitous in this context (27c).

Example (26b) is also a counterexample to Krifka's (1992) stipulation, discussed in § 4, that only the nucleus associated with the highest operator is realized with a pitch accent. In (26b), *only*, the operator that associates with *dream*, is lower than the putative ASSERT operator that associates with the entire verb phrase. Nevertheless, *dream* is realized with a pitch accent as or more prominent than the pitch accent associated with the larger pragmatic focus (the accent on *yours*).

6.2 Links as potential nuclei

In § 5 we emphasized the distinction between link—an element of the ground—and focus. It was noted that in languages like English and German both informational notions may be realized exclusively by prosodic means (unlike languages like Catalan or Hungarian, where the structural differences between the two are largely syntactic). This has lead to some confusion and to the conflation of the two notions in many cases.

The fact that links are also potential nuclei, i.e. focus-sensitive operators are able to associate with links adds to the confusion. Consider the following example from Vallduví (1992:143):

(28) John and Mary know the Amazon quite well,
but only John's [$_F$ been to the CITIES in Brazil.]

In the second sentence in (28) the (most natural) informational focus is the verb phrase. *John* acts as link and it is realized as such by being associated with an L+H* accent.

Hoeksema and Zwarts (1991:67) contend the force of example (28) and state that *John* is in some sense a 'focus' as well because it is associated with a pitch accent. However, it was shown in § 5 that the existence of nonfocal pitch accents is beyond doubt and that links are precisely ground elements that are typically associated with a fall-rise pitch accent. Thus, the fact that *John* in (28) is accented does not make it a focus, other than in the trivial sense of being a phonological focus (a pitch accent).

Again, the comparison of (28) with its Catalan equivalent is rather suggestive. In Catalan postverbal (in-situ) subjects are focal, whereas preverbal (topicalized) subjects are ground elements (links). Consider (29):

(29) Who has been to the cities in Brazil?

a. Només hi_1 ha estat el JOAN, a les ciutats del Brasil_1.

b. # Només el Joan hi_1 ha ESTAT, a les ciutats del Brasil_1.
'Only JOHN's been to the cities in Brazil.'

In (29) the question contextualization requires *John* to be the focus of the answer, since it corresponds to the wh-phrase in the question. In (29a) *John* appears in the focal postverbal position, while in (29b) it appears in the preverbal position characteristic of links (*a les ciutats del Brasil* 'to the cities in Brazil' is also part of the ground and is right-detached in both potential answers). Indeed, only (29a), which encodes *John* as a focus, is a felicitous answer in this context. Realizing *John* as a link, as in (29b), is out. Now compare (28) to its Catalan equivalent in (30):

(30) El Joan i la Maria coneixen l'Amazones bastant bé
però només el Joan ha estat a les ciutats del BRASIL.
'John and Mary know the Amazon quite well,
but only John's been to the cities in Brazil.'

The *John* in the second conjunct in (30) felicitously appears in a preverbal position, a position that is associated with a link interpretation. The contrast between (29b) and (30) can be accounted for only if the link status of *John* in the latter is recognized. Therefore, it must be concluded that ground elements—links, at least—can act as nuclei to focus-sensitive operators like *only*. The assumption that only foci can provide the necessary semantic structure that nuclei require is not well motivated.

In fact, it is not only links that may act as nuclei. Other ground elements, realized with no pitch accent whatsoever, can be nuclei as well. Examples of this sort were already discussed in § 4. In § 4, (8b) and (9b), repeated here, were discussed as examples of unaccented nuclei:

(8) a. Eva only gave xerox copies to the GRAduate STUdents.

b. (No,) PETR only gave xerox copies to the graduate students.

(9) a. Who always took JOHN to the movies?

b. MARY always took John to the movies.

From the standpoint defended in this paper, the fact that the nuclei in (8b) and (9b) are unaccented is unproblematic. These nuclei are plain ground elements and there is no informational reason for their association with a pitch accent. Since nuclei do not need to be foci, there is no need for any additional explanation to account for the fact that the nuclei of *only* and *always* are not realized with typical focal prosody. These nuclei are simply not informational foci. Once again, we are compelled to conclude that nonfocal elements can act as quantificational nuclei.

Krifka 1991-92 explicitly treats some link nuclei as focal nuclei in examples like (31). He claims that *youngest* is a focus within the ground (or within the link or topic) of the sentence. Thus, he argues, sentences like (31), which appear to have a 'focus' within the link (for him, within the topic), constitute evidence for the recursive status of the informational partition of sentences:

(31) What did Bill's sisters do?
[$_L$ Bill's [$_F$ YOUNGEST] sister] [$_F$ kissed JOHN.]

Although this would provide support for the view that more than one focus-ground structure is allowed in a simplex sentence, it also represents, as noted, a significant departure from the traditional conception of focus in the pragmatic literature. However, on closer inspection, the evidence for the focal status of *youngest* fades away. Example (31) is, in fact, analogous to example (32):

(32) What did Bill's siblings do?
[$_L$ Bill's SISTER] [$_F$ kissed JOHN.]

In both (31) and (32) we have a sentence with a link pitch accent (L+H*) and a focal pitch accent (H*(L)) in a typical 'suspension bridge' pattern. The pitch accent on *sister* in (32) is clearly a characteristic link-associated accent of the type discussed in § 5 and so is the pitch accent on *youngest* in (31). The only difference between (31) and (32) is that in the former sentence the pitch accent is not realized on the rightmost item within the link but rather appears to have shifted to the left.

This, however, is not enough motivation to argue that *youngest* is a focus within the link. In fact, the leftbound prosodic shift in the link in (31) is not the reflection of any informational or communicative effect, but rather another instance of the deaccenting phenomenon discussed in § 5.2. The deaccenting process discussed in § 5.2 took place within the focus constituent, but, as (31) shows, deaccenting can take place within the link constituent as well. The pitch accent on *youngest* in (31) is the same pitch accent associated with *sister* in (32). It expresses the linkhood of the subject noun phrase and it does not indicate that *youngest* is a focus in any sense. Thus, (31) should not be informationally partitioned as Krifka indicates, but rather as in (33)

(33) What did Bill's sisters do?
[$_L$ Bill's YOUNGEST sister] [$_F$ kissed JOHN.]

Steedman 1991 notices the different prosodic pattern that one may encounter within focus and within ground. However, he does not suggest that the accenting shifts within these larger units imply that embedded focus-ground partitions exist within the top-level partition. Rather, he relates them to a notion of (de)emphasis, akin to the notions of concept-givenness and interestingness or informativeness that we discussed in § 5.

Of course, given that languages like Catalan and Italian do not possess a deaccenting strategy, we would expect these languages not to display prosodic patterns like the one within the link in (31). This is indeed the case. Consider the following examples ((34) is from Steedman 1991):

(34) A: I know Mary's undergraduate degree is in physics,
but what subject is her doctorate in?
B: [$_{\text{L}}$ Mary's DOCTORATE] [$_{\text{F}}$ is in CHEMISTRY.]

(35) A: I didn't know both of them have a doctorate...
B: Yes but [$_{\text{L}}$ MARY's doctorate] [$_{\text{F}}$ is in CHEMISTRY]
and [$_{\text{L}}$ ANNA's doctorate] [$_{\text{F}}$ is in LAW.]

Between these two English examples there is a prosodic contrast within the link triggered by deaccenting. In (35) the item *doctorate* within the link is deaccented because of a previous mention of that same item. If the view that the pitch accent on *Mary* in (35) is due to deaccenting of *doctorate* is correct, we should expect the Catalan equivalents of (34) and (35) to be identical, since Catalan lacks the deaccenting strategy. They are. Example (36) corresponds to English (34) and example (37) to English (35):

(36) A: Ja sé que la Maria té una llicenciatura de física,
però el seu doctorat de quina especialitat és?
B: [$_{\text{L}}$ El doctorat de la Maria] [$_{\text{F}}$ és de QUÍMICA.]

(37) A: No ho sabia, que totes dues fossin doctores...
B: Sí, però [$_{\text{L}}$ el doctorat de la Maria] [$_{\text{F}}$ és de QUÍMICA]
i [$_{\text{L}}$ el (doctorat) de l'Anna] [$_{\text{F}}$ és de DRET]

If *Mary* in (35) were a focus, Catalan (37) would have to structurally reflect that somehow. However, Catalan (36) and (37) are identical. The reason is that the focus-ground partition of these sentences (and of English (34) and (35)) is identical. The prosodic contrast observe in the English examples is the reflection of an orthogonal factor.

7 Conclusion

The data discussed in this paper show that nuclei need not be informational foci. Elements within the ground, both links and nonlinks can act as the nuclei of focus-sensitive operators like *only*. These findings are in agreement with Koktová 1987 and Nevalainen 1987, where it is also noted that nuclei can belong to either focus or ground.

The claim in Rooth 1985, 1992 and Krifka 1991-92, 1992 is that only foci have the appropriate semantic structure to be able to act as nuclei. Given that focus-sensitive operators are capable of associating with elements other than focus, this claim is found to be unmotivated. The semantic structure that characterizes nuclei (e.g. the introduction of ALT(x)) can be made available through means that have nothing to do with informational focus. In this sense, for instance it is wrong to argue that there is a one-to-one mapping between the focus-ground partition and the quantificational <RESTRICTOR, NUCLEUS> structure of a sentence. We showed that, while it is true that a focus-sensitive operator may parasitize, piggyback style, on a focus-ground partition, they can also utilize partitions other than focus-ground to express their meaning. In other words, focus does not necessarily determine the identity of the nucleus.

One way around the problems posed by the data discussed above is to stretch the notion of informational focus so as to incorporate under this label all attested nuclei. In fact, this is precisely what these authors have to do to describe the meaning of focus-sensitive operators, since from their perspectives only focus-ground provides the necessary semantic structure that these operators require to express their semantics. Such a move, however, is not uncontroversial. The analysis of deaccenting and the comparison of English to Catalan and Italian above indicate that nonfocal nuclei are a fact which any account of the meaning of focus-sensitive operators should take into account.

Accepting that nonfocal nuclei exist frees us from having to posit multiple focus-ground partitions for sentences with more than one focus-sensitive operator. Obviously, from a nuclei-must-be-foci point of view, one must argue for recursive focus-ground structures within a simplex sentence. However, if nuclei can be specified otherwise, this is not so anymore, since the presence of a focus-sensitive operator does not entail the presence of a focus. This approach naturally accommodates the many examples discussed above where the informational focus-ground partition differs from the <RESTRICTOR, NUCLEUS> partition. For Krifka, for instance, these examples are all cases with more than one focus-ground partition. He then has to provide an additional account for the fact that some of these foci are not structurally realized as such. No such additional mechanism is needed if the position defended here is the correct one. Of course, if the structured meaning approach to quantificational structure is correct, sentences with more than one operator would still require more than one <RESTRICTOR, NUCLEUS> partition. We have shown, however, that this does not entail that they have more than one focus-ground partition.[9]

The relationship between quantificational structure, informational structure and prosody needs to be accounted for with a more modular approach. The focus-ground partition is present in sentence structure for communicative purposes, probably having to do with the way in which information is presented to an updating agent. Pitch accents are available as a structural resource and they appear to be exploited for a number of different uses. Some of them have to do with the realization of focushood and linkhood, while other accenting phenomena are linked to other independent factors. Finally, an independent quantificational structure must accompany each operator in a sentence. The interaction among these components, however, is complex. Pitch accents do not appear to have a unique interpretation, focus-ground is realized in different ways in different languages, and nuclei may be accented or deaccented and maybe focal or ground.[10]

[9] Embedded sentences may have their own focus-ground structure, so in some sense focus-ground is indeed recursive. This type of recursiveness, however, is acknowledged in the informational literature and will not be discussed here, although the fact that embedded sentences may display informationally motivated structural properties deserves a more detailed analysis.

[10] Current work within DYANA-2 is looking at how this modular approach to quantificational structure, informational structure, and prosody can be spelled out from the perspective of sign-based syntactic formalisms.

References

Bardovi-Harlig, Kathleen: 1983, On the claim that topics are not stressed, *CLS* (*Parasession*) 19, 17-27.

Bolinger, Dwight L.: 1961, Contrastive accent and contrastive stress, *Language* 37, 87-96.

Bolinger, Dwight L.: 1986, *Intonation and its parts: melody in spoken English*, Stanford University Press, Stanford.

Bolinger, Dwight L.: 1989, *Intonation and its uses: melody in grammar and discourse*, Stanford University Press, Stanford.

Cohen, Antonie and Johan 't Hart: 1967, On the anatomy of intonation, *Lingua* 19, 177-192.

Deemter, Kees v.: 1992, What's new? Semantic notions of 'new information' for intonational focusing, unpublished manuscript, IPO Eindhoven.

Erteschik-Shir, Nomi: 1986, Wh-questions and Focus, *Linguistics and Philosophy* 9, 117-149.

Féry, Caroline: 1992, Focus, topic and intonation in German, *Arbeitspapiere des Sonderforschungsbereichs 340*, # 20.

Gundel, Jeanette K.: 1974, *The role of topic and comment in linguistic theory*, Ph.D. dissertation, University of Texas, Austin, published by Garland, New York, 1989.

Heim, Irene: 1982, *The semantics of definite and indefinite noun phrases*, Ph.D. dissertation, University of Massachusetts.

Hockett, Charles A.: 1958, *A course in modern linguistics*, Mcmillan, New York.

Hoeksema, Jacob and Frans Zwarts: 1991, Some remarks on focus adverbs, *Journal of Semantics* 8, 51-70.

Jackendoff, Ray: 1972, *Semantic interpretation in generative grammar*, The MIT Press, Cambridge.

Jacobs, Joachim: 1984, Funktionale Satzperspektive und Illokutionssemantik, *Linguistische Berichte* 91, 25-58.

Jacobs, Joachim: 1991, Focus ambiguities, *Journal of Semantics*, 8, 1-36.

Koktová, Eva: 1987, On the scoping properties of negation, focusing particles, and sentence adverbials, *Theoretical Linguistics* 14, 173-226.

Krifka, Manfred: 1991-92, A compositional semantics for multiple focus constructions, *Linguistische Berichte*, Suppl. 4, 17-53.

Krifka, Manfred: 1992, A framework for focus-sensitive quantification, *Ohio State University Working Papers in Linguistics* (*SALT II*) 40, 215-236.

Krifka, Manfred: 1993, Focus, presupposition, and dynamic interpretation: The case of focus-sensitive particles, in K. Bimbó and A. Máté (eds.), *Proceedings of the Fourth Symposium on Logic and Language*, 31-59, Áron, Budapest.

Kuno, Susumu: 1972, Functional sentence perspective, *Linguistic Inquiry* 3, 269-320.

Lambrecht, Knud: 1987, Sentence focus, information structure, and the thetic-categorical distinction, *Berkeley Linguistics Society* 13, 366-382.

Ladd, D. Robert: 1980, *The structure of intonational meaning: Evidence from English*, Indiana University Press, Bloomington.

Ladd, D. Robert: 1983, *Even*, focus, and normal stress, *Journal of Semantics* 2, 157-170.

Ladd, D. Robert: 1988, Declination 'reset' and the hierarchical organization of utterances, *Journal of the Acoustic Society of America* 84, 530-544.

Ladd, D. Robert: 1990, Metrical representation of pitch register, In J. Kingston and M. Beckman (eds.), *Papers in laboratory phonology I*, 35-57, Cambridge University Press, Cambridge.

Lehman, Christina: 1977, A re-analysis of givenness: stress in discourse, *CLS* 13, 316-324.

McLemore, Cynthia A.: 1991, *The pragmatic interpretation of English intonation: Sorority speech*, unpublished Ph.D. dissertation, University of Texas, Austin.

Nevalainen, Terttu: 1987, Adverbial focusing and intonation *Lingua* 73, 141-165.

Partee, Barbara H.: 1991, Topic, focus, and quantification, *Cornell Working Papers in Linguistics* (*SALT I*) 10, 159-187.

Pierrehumbert, Janet B.: 1980, *The phonology and phonetics of English intonation*, unpublished Ph.D. dissertation, Massachusetts Institute of Technology.

Pierrehumbert, Janet B. and Julia Hirschberg: 1990, The meaning of intonational contours in the interpretation of discourse, in P. Cohen, J. Morgan and M. Pollack (eds.), *Intentions in communication*, 271–311, The MIT Press, Cambridge.

Prince, Ellen F.: 1986, On the syntactic marking of presupposed open propositions, *CLS* (*Parasession*) 22, 208-222.

Rochemont, Michael S.: 1986, *Focus in generative grammar*, John Benjamins, Amsterdam.

Ronat, Mitsou: 1979, Pronoms topiques et pronoms distinctifs, *Langue Française* 44, 106-128.

Rooth, Mats: 1985, *Association with focus*, unpublished Ph.D. dissertation, University of Massachusetts.

Rooth, Mats: 1992, A theory of focus interpretation, *Natural Language Semantics* 1, 75-116.

Sasse, Hans-Jurgen: 1987, The Thetic/categorical distinction revisited, *Linguistics* 25, 511-580.

Schauber, Ellen: 1978, Focus and presupposition: A comparison of English intonation and Navajo particle placement, in D.J. Napoli (ed.), *Elements of tone, stress, and intonation*, 144-173, Georgetown University Press.

Sgall, Petr, Eva Hajičová and Jarmila Panevová, 1986: *The meaning of the sentence in its semantic and pragmatic aspects*. Reidel, Dordrecht.

Solà, Jaume: 1992, *Agreement and subjects*, Ph.D. dissertation, Universitat Autònoma de Barcelona.

Stechow, Arnim v.: 1981, Topic, Focus and local relevance, in W. Klein and W. Levelt (eds.), *Crossing the boundaries in linguistics*, 95-130, Reidel, Dordrecht.

Stechow, Arnim v.: 1991, Focusing and backgrounding operators, in W. Abraham (ed.), *Discourse particles*, 37-84, John Benjamins, Amsterdam.

Steedman, Mark: 1991, Structure and intonation, *Language* 67, 260-296.

Vallduví, Enric: 1992, *The informational component*, Garland, New York.

Vallduví, Enric: 1993, Catalan as VOS: Evidence from information packaging, in W.J. Ashby, M. Mithun, G. Perissinotto, and E. Raposo (eds.), *Linguistic Perspectives in the Romance Languages*, 335-350, John Benjamins, Amsterdam.

Ward, Gregory L.: 1988, *The semantics and pragmatics of preposing*, Garland, New York.

Ward, Gregory L. and Julia Hirschberg, 1985: Implicating uncertainty. *Language* 61, 747-776.

Zacharski, Ron: 1993, *Discourse Pragmatics Model of English Accent*, unpublished Ph.D. dissertation, University of Minnesota.