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1. Introduction

In this paper we will be concerned with what we call the focus-pitch accent relation. This subject belongs to the phonology of focus.

We could start in mediis rebus right from the beginning and talk about this relation. But we will not do so. A bit of background will be appropriate because our conception of focus is perhaps not generally accepted, although we hope that it is the correct conception.

The general claims of our paper are the following.

1. Focus is a device for indicating the scope of an operator. A focussing operator is one which has besides scope one or more arguments which are identified by means of focus.
2. It follows from this that the origin of any focus whatsoever is an operator, visible or not. This operator assigns focus (F) to a constituent of the S-structure (or perhaps even to a D-structure constituent).
3. It is a further consequence of this view that focus does not have meaning. Rules of focus interpretation make about as much sense as rules of scope interpretation. If there is sometimes a connection between focus and "new information", then this is nothing but a reflex of the semantics of the particular focussing operator involved.
4. Focus is realised phonetically by one or more pitch accents (PA's). The relation between F and PA is called the focus-pitch accent relation (F-PA-relation). This relation is the major topic of our paper. Our main claim about it can be resumed as follows: F assignment to a constituent is determined syntactically (cf. Jacobs' paper), but the F-PA-relation is not. The rules determining this relation are to be formulated exclusively on the level of so-called "argument structure".

We will justify this view by means of a critical and constructive analysis of Lisa Selkirk's focus rules, which still assume a certain amount of syntactic information proper. At the end of the paper we will risk our own formulation of the focus rules.

2. The Origin of Focus

We now embark upon the first of our claims and give some motivation for our view that the origin of focus is always a focussing operator.

Since the seminal article by Karttunen & Peters [1979], this view is generally accepted for focussing particles. Focussing particles have scopus and focus. We may represent the possible focus of even in

(1) John even understands Syntactic Structures

by (2)(i) and (ii) respectively.

(2)(i) John even_i [_iunderstands] Syntactic Structures

(ii) John even_i [_iunderstands Syntactic Structures]

The "logical Form" of these will be something like

(3)(i) even (John understands S.S., understand)

(ii) even (John understands S.S., understand S.S.)

Clearly the two representations mean something different. In Karttunen & Peter's analysis (3)(i) means perhaps something like "John understands S.S. and among the cognitive relations John is pre-supposed to have towards Syntactic Structures, understanding is the least likely."

(3)(ii) means something analogous, but instead of considering the two-place relation of understanding, we focus on the entire predicate "understanding Syntactic Structures".

Clearly the details of the semantic analysis of focussing particles are much more complicated and the representations (3 i) and (3 ii) are not even entirely correct. What is important for this discussion is, however, only the following: focussing operators are two place operators. One argument is determined syntactically by the usual restrictions governing scope choice, but the other argument is marked by the focus feature F.

Consider now focus in sentences where no focussing operator occurs.

(3) OTTO geigt

(4) Otto GEIGT

In (3), the subject is a focus and in (4) the focal stress lies on the predicate. Stop. Are we entitled to say this? We have said that focus is a relational concept. Focus is focus of an operator. But in (3) and (4) there is no operator where the focus could come from.

We could, of course, introduce a second notion of focus, namely absolute focus and represent the focus structures of (3) and (4) as

(5) $_F$ [Otto] geigt

(6) Otto $_F$ [geigt]

This is, actually, what happens in an overwhelming part of the literature. Now, if our view that focus is just a special instance of scope is right, then the notion of absolute focus doesn't make sense. Scope is always scope of some operator.

It seems to be a pretty straightforward idea then to subsume absolute focus under relative focus. Although this is a very natural move, the idea was not carried out until recently by Jacobs (vide Jacobs [1983]). Following proposals elaborated by Zaefferer [1981], Jacobs introduces for each matrix sentence an invisible illocutive operator which is, of course, a focussing operator. It is not so important which operator we have on any particular occasion, there is a considerable amount of vagueness here. The important thing is that this operator has focus. Therefore it is visible through the focal accent it triggers.

Let us consider the two sentences (3) and (4) again. Their relevant focus structures are (7 i) and (7 ii) respectively:

(7)(i) Op_i [$_i$ Otto] geigt

(ii) Op_i Otto [$_i$ geigt]

This way we don't have absolute focus but relative focus. The focus of the invisible operator Op is Otto in the first case, and geigt in the second sentence. The scopus of Op is in both cases the entire sentence.

As to the semantics of this invisible operator, we may think of the interpretation, of (7)(i) and (ii) as something like (8)(i) and (ii) respectively, or as something structurally similar:

(8)(i) As to your question "Who is playing the violin?" I answer "Otto".

(ii) I answer your question "What is Otto doing?" by "playing the violin".

A little reflection on (8 i) and (ii) shows that the two utterances clearly differ in meaning.

Even this crude sketch hints at an answer to the question of what the connection between focus and new information is. It is a reflex of the semantics of an invisible illocutive operator such as answering or asserting that the focussed part of the utterance is new information in some sense. But this connection is entirely contingent. Take, e.g., a rejecting particle:

(9) A: Ede hat promoviert.

B: Nicht EDE, sondern WOLFGANG

clearly, in this case, "Ede" is a focus but old information.

The last example leads to the question whether it is really a wise strategy to analyse all kinds of focus as the scope indication of an extra argument of a focussing operator. Maybe this is too reductionistic a view.

Consider, for instance, corrective stress indicating that something has to be replaced:

(10) Not SPRIGtime for HINTler

— SPRINGtime for HITler

(11) Nicht FLÄSCHENHALSE - sondern FLÄSCHENHÄLSE.

Even in such cases the origin of the foci seems to be a focussing operator, something like the contrasting not ... but, nicht ... sondern. The semantic of these operation can't operate on meaning alone. Metalinguistic use certainly is involved. But the mechanisms determining the focus-pitch accent relation seem to be the same also for this case.

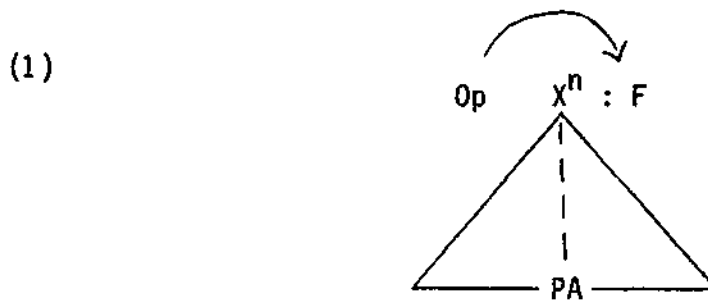
The F-PA-relation is the next point on our program. Let us turn to it next.

3. The phonological Component

It is the task of certain phonological rules to spell out the focus realisation. Our particular interest concerns the focus rules.

Recall that the general picture is this.

An operator assigns the focus feature F to some constituent. Then the focus rules determine where F is realized as a pitch accent PA.

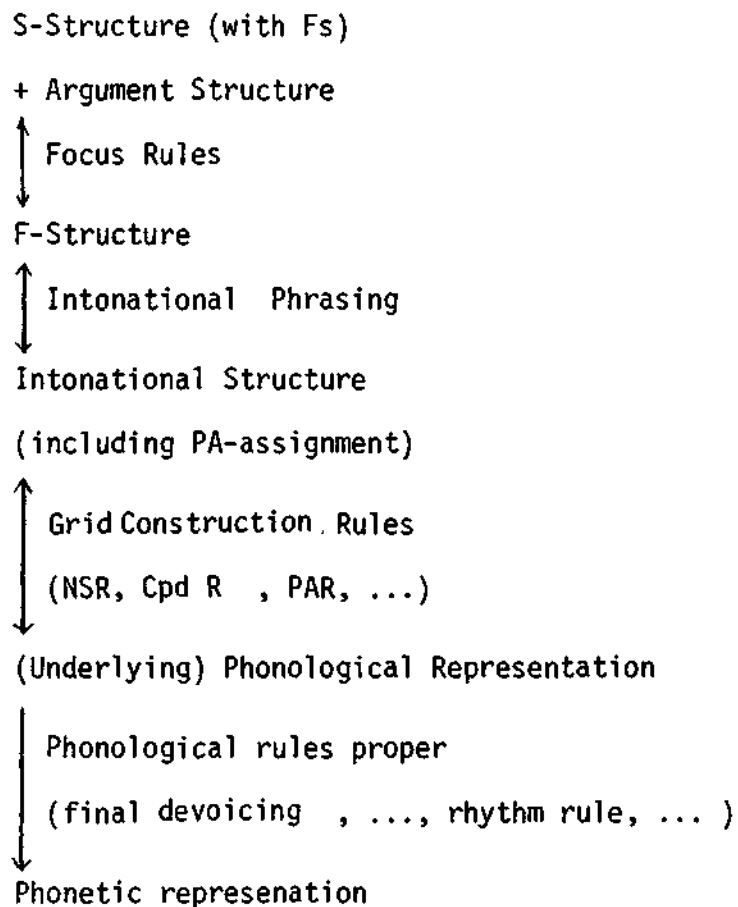


Recall that we call the relation between focus and pitch accent F-PA-relation. It is our concern to discuss the rules which determine this relation. Since rather complex terminological distinctions are necessary for a non-superficial discussion of the matter, we will give a sketch of the organisation of the phonological component of the grammar.

Our exposition will follow closely Selkirk [1982] although it will deviate from it in some details - perhaps important ones. Selkirk assumes some version of the extended standard theory.

It will be convenient to keep the synopsis (2) in mind during the following remarks.

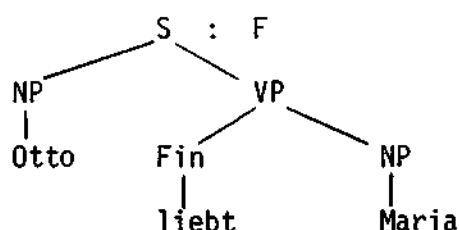
(2) (cf. Selkirk [1982, fig. 5.2.])



This theory assumes that the input for the phonological rules is a syntactic structure - the S-structure - which is converted by the phonological rules into the phonetic representation.

Now, the assumption is that an S-structure has, in addition to the usual morpho-syntactic features, the focus feature F on one or several constituents. F will be phonetically realized as a pitch accent (PA), which consist of one or more tones, one of which is a tropic tone. Assume, for convenience, that we are given the surface-structure

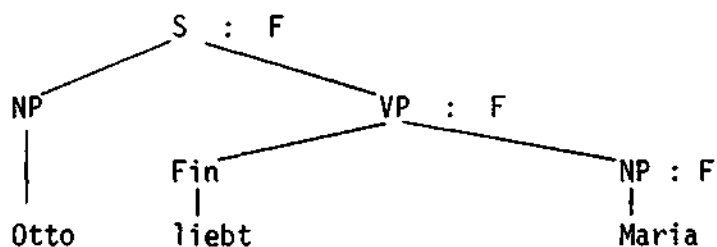
(3)(i)



Assume further that the pitch accent which realizes F is the tone sequence PA = L + H* + L. The asterisk marks, the tropic tone, the tone assigned to the most prominent syllable.

Selkirk assumes now that there are focus rules which determine that the realisation of F, i.e. PA, goes to the object. She calls the structure which describes the "realisation path" of the focus-structures, F-structures. Thus the focus rules, to which we will come in the next section, map the surface structure (3)(i) into the F-structure (3)(ii):

(3)(ii)



PA = L + H* + L

Thus, a focus-structure tells us what the focus-pitch accent-relation, the F-PA-relation, is.

The question is now, what kind of information do the focus rules need in order to do their job successfully. In earlier research work (Chomsky [1971], Jackendoff [1972]), it has been assumed that the F-PA-relation is determined by phrasal stress, for instance NSR. This is clearly false. Selkirk [1982, 5.2.2] gives convincing arguments against this view, which we will not repeat. She argues that the F-PA-relation is determined partly syntactically, partly "functionally" in terms of the predicate-argument structure. We think that this view is basically correct, although we will have some criticism of Selkirk's formulation of the focus rules, which we will discuss in some detail in the next section.

F-structures are the input for the rules building up the intonational structure.

Intonational Structures have three aspects:

- the intonational phrase structure
- the intonational contour
- pitch accent assignment

Intonational phrases (IPh) are determined by the rules of intonational phrasing. The exact nature of these rules is of no concern for the present discussion. The first explicit theory of IPhs within generative grammar is developed in Bierwisch [1966]. Bierwisch assumes that possible IPhs are determined by syntactic factors (optional deletion of certain phrase boundaries) and the rules of enclisis (roughly, the clitic goes to the constituent separated from it by the weaker phrasal boundary). Selkirk [1982, 5.4.3.] determines possible IPhs "functionally": IPhs form 'sense units', they are connected by the argument-predicate-relation, the modifier-modificandum-relation and so on. Whatever the right theory of IPhs may be, the important point is that intonational phrases need not be syntactic phrases, i.e. S-structure phrases. Possible intonational phrases for our sentence are (4)(i) to (iv):

- (4)(i) (Otto liebt Maria)
(ii) (Otto liebt)(Maria)
(iii) (Otto)(liebt Maria)
(iv) (Otto)(liebt)(Maria)

Consider (4 ii): the IPh (Otto liebt) does not correspond to any syntactic constituent. Similarly, if we consider the sentence

- (5) Otto schenkt Ede ein Buch,

then (Ede ein Buch) can't be an IPh, since the two NPs are not connected by the predicate-argument relation.

Notice that Selkirk's rules of intonational phrasing are very similar to the rules Gussenhoven has presented in Gussenhoven [1983]. Gussenhoven's rules are more elaborated because he considers also adverbs ("conditions").

If we understand Selkirk correctly, then the rules of intonational phrasing don't influence the focus rules. So this is a "later" phonological process. It seems to us that this assumption is problematic.

In section 5 we will discuss some data which suggest that the focus rules "see" both the S-structure and the intonational phrases. If this correct, then the ordering of the phonological rules which Selkirk assumes has to be rearranged in an appropriate fashion. It seems to us that we are in agreement with Gussenhoven [1983] on this point.

The intonational structure is the input of the rules which build up the phonological representation proper. This representation consists of several tiers in the sense of autosegmental phonology (cf. Goldsmith [1976]). The tiers include at least the following aspects:

- phonological phrase structure such as syllable, phonological word and intonational phrase
- the intonational contour
- the metrical grid

The association between syllables and beats on the metrical grid is indicated by placing the towers directly over their syllables. The association between the pitch accent $L + H^* + L$ is indicated by association lines.

This association is determined by the rule of Pitch Accent Association which says that the tropic tone of a PA (in our case H^*) is associated with the syllable carrying the most prominent beat. The rule presupposes, of course, that the PA has been assigned to a word by means of the focus rules. For details, vide Selkirk [1982, 5.101].

We haven't said anything so far as to the rules which build up the phonological representation. These include classics, such as the nuclear stress rule (NSR), but also parvenus such as the pitch accent prominence rule (PAR), which says that a syllable with PA is more prominent in terms of beat levels than any other syllable of the same IPh which has no PA associated with it.

The phonological representation is the input for the phonological rules proper. In German, e.g. final devoicing, degemination, glottal stop insertion and others. As for the intonational structure, it is the input for the euphony rules, i.e. rules which only "see" the metrical grid and make no use of syntactic information. A typical rule of this kind is the rhythm rule which provides for rhythmical alternation, avoiding beat clashes and so on.

4. Selkirk's Focus Rules

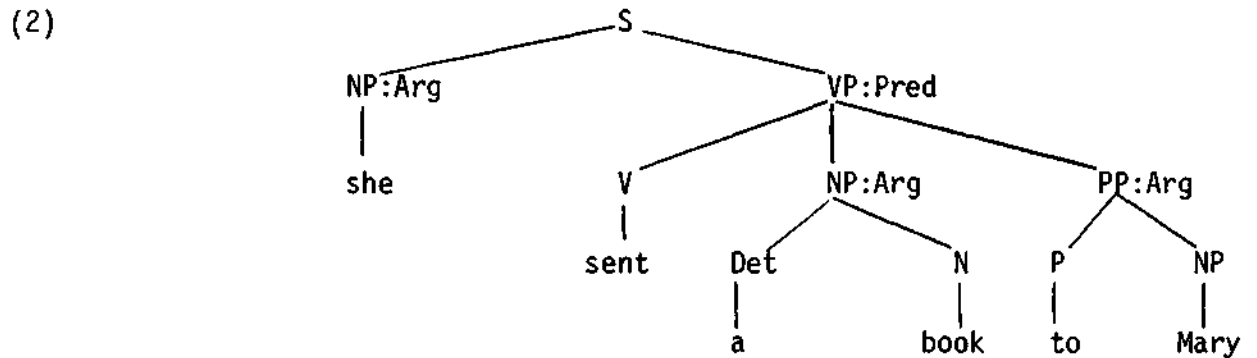
In this section we will discuss Selkirk's focus rules and stress the points of agreement and disagreement. In the next section we will sketch our own view of the nature of these rules.

Let us recall that the task of the focus rules is to determine the F-PA-relation. The input of the rules are S-structures.

Now, one of Selkirk's main points is that S-structures per se don't give us enough information for determining the focus-pitch accent-relation. We have to enrich the syntactic information by some sort of semantic information: e.g. the predicate-argument relation and perhaps the modifier-modificandum relation and others. Selkirk calls a structure with this additional information argument structure. We may think of the argument structure as a syntactic tree plus labels indicating the above mentioned relations. Thus, the argument structure of the sentence

(1) She sent a book to Mary

is something like



Thus an argument structure incorporates two kinds of information: syntactic information and relational semantic information, and the focus rules are able to look at both kinds of information.

Selkirk assumes two focus rules.

The first, which is called Basic Focus Rule, stipulates that a word is focussed if it receives a pitch accent.

Basic Focus Rule: A constituent which has a pitch accent assigned to it is focussed.

The second, the Phrasal Focus Rule, guarantees a recursive definition of focus.

Phrasal Focus Rule: A constituent may be focussed if its head (usually a word) is focussed and/or a constituent contained within it which is an argument of its head is focussed.

The Phrasal Focus Rule says that focus may be projected along the 'projection line' in the sense of \bar{X} -theory or that F may be projected from an argument to the predicate.

Neither of the focus rules pays attention to the word order of the surface structure.

Thus, a VP for example, may be focussed if either the verb (the head) or its argument(s), or both, are focussed:

- (3) She watched KOJAK
- (4) She WATCHED Kojak.
- (5) She WATCHED KOJAK

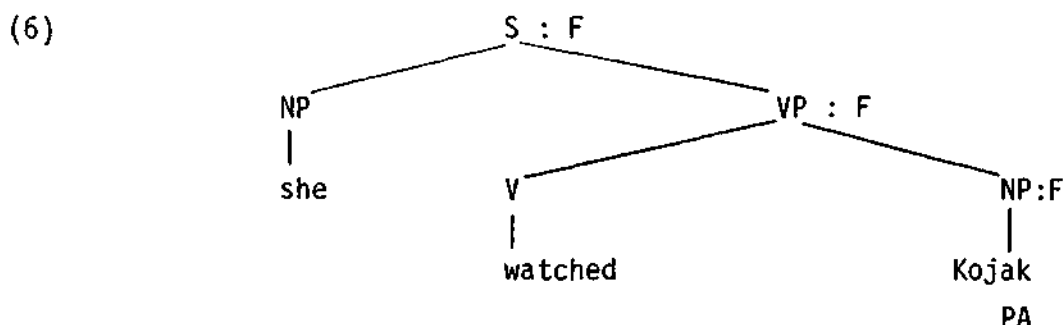
Consider, for instance, sentence (3).

Besides the already mentioned VP-Focus, it has another intonational meaning, and thus another focus structure: there may also be a 'narrow' focus on the object NP resulting from the application of the Basic Focus Rule, which assigns focus to simple constituents. This meaning is the one which is commonly called 'contrastive'. The application of the Phrasal Focus Rule is thus optional: there may be a focus on a higher constituent as well, but it is consistent with the set of rules if there is none. The same sort of analysis works for sentence (4) and (5).

As the focus rules serve to define the F-PA-relation, the Phrasal Focus Rule may be thought of as the "induction step" for a recursive definition of that relation, whereas the Basic Focus Rule is the "basis" of the recursion.

This particular attempt to define the relation has, however, some empirical consequences which are not desirable. We will first point out these consequences and then say why we consider them problematic.

One possible focus structure of (3) is



If (3) is uttered "out of the blue", we would want to say that the entire sentence is a focus. Selkirk's rules can't express this. Her recursive definition of focus guarantees that the focus feature F is projected from the object Kojak to the VP-constituent, but it has to stop there. We, however, would like to say that it is also projected to the S. Let us suppose then that we generalize Selkirk's definition in a way that this result is obtained.

Now, it is a consequence of the Phrasal Focus Rule that any constituent on the "F-projection line" is a focus as well. In other words, we can't say that S is a focus but VP and the object of VP are not. Yet, it should be obvious from our remarks on "focus interpretation" in section 2 that this is precisely what we want to say. If we adopt our view that focus is simply a scope device indicating an argument of some possibly invisible operator, then this desideratum is well motivated.

But the consequence mentioned above, is a problem even if we adopt Selkirk's own interpretation principles of focus (which we believe to be untenable but which we will take for granted for a moment). Selkirk's focus interpretation principle is this:

Focus Interpretation Principle
F(argument) \leftrightarrow new information

The first problem is that this principle is stated as a biconditional: only arguments can be new information.

Clearly, this is too restrictive. We also want to say that a predicate or a sentence can be new information.

(7)(i) What did she do? - She watched Kojak

(ii) Any news? - Mary watched Kojak

In (7 i), the new information conveyed by the answer is the VP, in (8 ii), it is the entire sentence.

The other direction of the conditional is implausible, too. Kojak may be well known, i.e., old information in some sense. But the predicate "watching Kojak" may very well convey some new information, namely that it applies to Mary. In other words, a predicate may be new information without implying that its constituents all convey new information.

So the interpretation principle does not make much sense, as it stands. The difficulties arise partially from the unclear notion of new information. There have been a number of proposals to clarify this notion: Stechow [1980], Heim [1982], Manor [1983]. Let us assume that this concept can be made precise and that it must be relativized to a particular position in the structure. Even then, however, the principle is demonstrably wrong. In the following discussion we will need this principle only on one occasion, namely, when we discuss cases of the so-called accent or focus by default.

In this paper our main interest is the focus-pitch accent relation. Let us return to it by examining what Selkirk's focus rules predict about it. Consider the following examples:

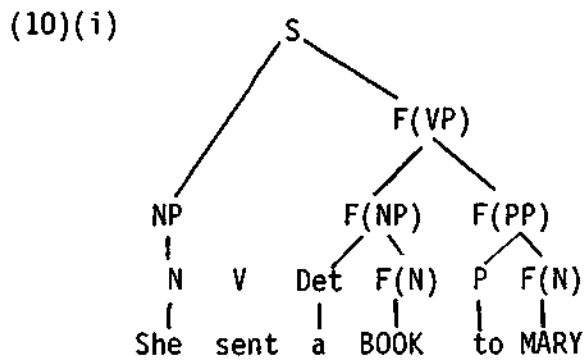
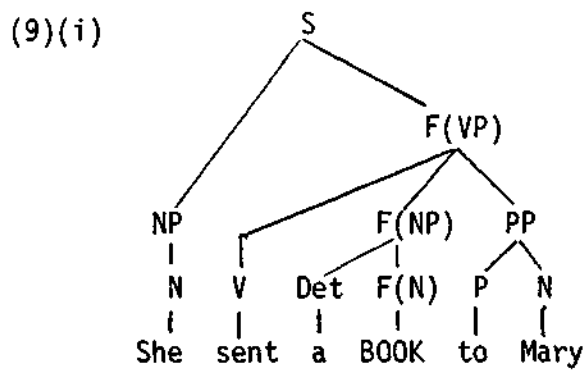
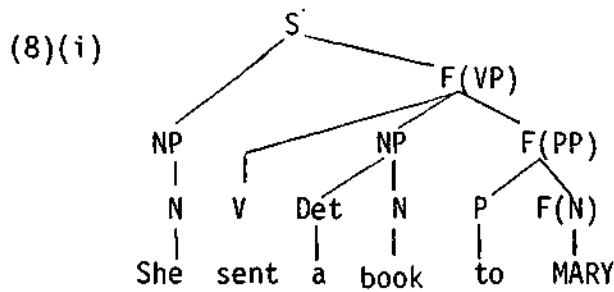
(8) She sent a book to MARY.

(9) She sent a BOOK to Mary.

(10) She sent a BOOK to MARY.

In all these sentences there is a 'narrow' or 'contrastive' intonational meaning and also (optionally) a broad focus on the entire VP.

For the VP-focus cases Selkirk presents the following focus structures:



Sentence (10) is an optimal 'out of the blue' sentence (an answer to a question like 'What happened?' or 'What's going on?'), because the VP contains two arguments which are both focussed and therefore interpreted as 'new information', with the provisos mentioned. Each of the two foci is able to pass the focus feature up to the higher constituent, to the VP.

Sentence (8) and sentence (9), however, contain within the VP one focussed ('new') and one unfocussed ('old') argument. Nevertheless, the VP can receive the focus feature in both cases, because the focus rules don't take the word order of the surface structure into account. According to Selkirk there is no important difference between sentence (9) and sentence (10). Both are presented as instances of VP-focus containing one focussed and one unfocussed argument and thus as evidence that a VP-focus is possible even when not every argument within the VP is focussed. In one case book is said to be "somehow present in the discourse" and in the other Mary. Both sentences are appropriate 'out of the blue' answers. They receive this property - as we have said - by definition, because they have VP-focus.

We don't think that this analysis is correct and we will now proceed to justify our objections.

I. Focus projection from the head constituent to the entire constituent is correct for some NPs but doesn't give the correct predictions for VPs and PPs.

Consider the following examples: ¹⁾

NP-focus:

(11) ein alter MANN

(12) a red TIE

VP-focus:

(13) *Xenia SCHENKT ihrer Mutter einen Fernseher.

(14) *I SAW her again today.

PP-focus:

(15) *Franz bringt Odo IM Staatsdienst unter.

(16) *IN such circumstances, people are likely to try something else.

1) The English examples are taken from Selkirk's manuscript and the German ones from our own corpus.

In the starred sentences we can't have broad focus, in general. Even for the NP-cases it may be said that Selkirk's rules give the right results only by chance. In the cases she considers, the head of the NP is always the rightmost constituent. As soon as we consider NPs where the head is on the left or in the middle, we obtain the wrong results.

(17)(i) ein MANN mit Vermögen

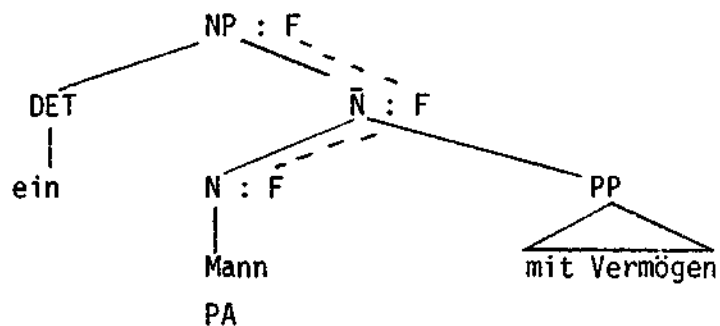
(ii) ein Mann mit VERMÖGEN

(18)(i) un UOMO forte

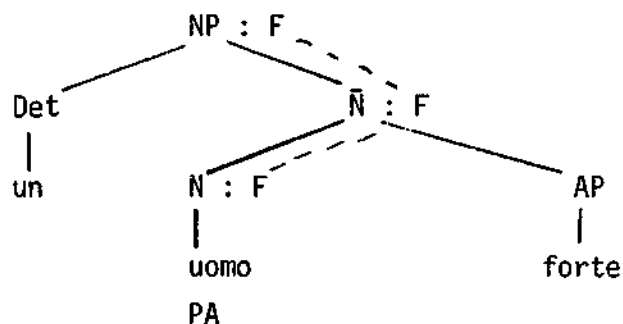
(ii) un uomo FORTE

In each of the (i) cases the focus is 'narrow' and can't be projected along the head line. Thus, the following F-structures are, in general, not possible:

(17)(iii) *



(18)(iii) *



Thus, it seems to be the case that the head line is unimportant for the determination of the F-PA-relation. It rather seems to be the case that the F-feature is inherited by the rightmost constituent, when the predicate-argument relation is not involved.

The same considerations apply to the examples (13) to (16). The phrasal focus rule predicts possible broad focus for (14) and (16):

(14)* I[SAW her again today]
VP:F

(16)* [IN such circumstances]
PP:F

Again, F-projection along the head line is in general not possible.

On the other hand, there are cases where F-projection is possible along the projection lines. This is so for the phenomenon known as accent by default (cf. Ladd [1980]).

Consider one of Ladd's well-known examples:

(19) A: Has John read SLAUGHTERHOUSE-FIVE?

B: No, John doesn't READ books.

READ is in no sense a 'contrastive' narrow focus here, for this would imply that John is doing something else other than reading books (collecting, writing, burning them). The point of this accentual pattern is rather that books is deaccented (because the notion of 'books' is implied in the naming of a special title and this title was focussed in the preceding question) and that the accent falls on read by default. This is a functional explanation which we believe to be basically on the right track. This explanation says that the focus rule may be overruled by pragmatic constraints, just as for instance the rule of disjoint reference is overruled in a sentence such as

(20) She_i is [John's wife]_i

by the necessity of expressing an identity. We think that that focus by default cases simply violate the focus rule in the same way as (20) presumably violates the rule of disjoint reference.

To analyse the examples as unproblematic instances of focus inheritance from a head to the intire constituent obscures this fact.

So far we have been concerned with the condition of Selkirk's rules allowing for focus projection along the head line. We now consider the claim that the focus of a predicate may be inherited by an argument. We think that this condition is too general and needs some qualification. Roughly, the following seems to be the case.

II. F-projection in VP

In case a VP contains more than one argument, focus projection to the VP is only possible if it is the rightmost argument which is focussed.

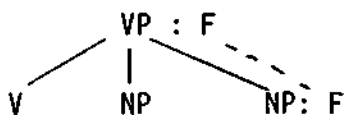
Consider

(21) She sent a book to MARY.

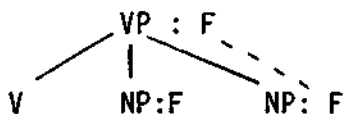
(22) She sent a BOOK to Mary.

It seems to us that only (21) can be interpreted as a broad focus, if uttered out of the blue. (22) can only have broad focus if Mary is already "somehow present in the discourse". So this would be a case of focus by default. On the other hand, it seems perfectly possible to have broad focus if both objects of a VP carry a pitch accent. This was the case in sentence (10). We may summarize these observations by the following diagrams:

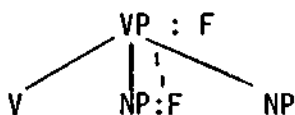
(23)(i)



(ii)



(iii)



That F is regularly inherited by the rightmost argument is borne out by data from German.

Consider the following sentences. They are all uttered by test subjects as 'out of the blue responses' after questions like

'Was ist los?'

'Gibt's was Neues?'

'Ist dir was aufgefallen?'

- (24) Xenia schenkt ihrer Mutter einen FERNSEHER
- (25) Veronika hat ihrer Mutter einen FERNSEHER mitgebracht.
- (26) Franz bringt Odo im STAATSDIENST unter.
- (27) Franz hat Odo im STAATSDIENST untergebracht.
- (28) Ede begleitet Susanne nach HAUSE.
- (29) Ede hat Susanne nach HAUSE begleitet.

Although we have different types of arguments, the test persons always choose the rightmost one for realizing the pitch accent in this sequential context. Let us summarize the discussion of this paragraph by trying to formulate some empirical generalisations as to focus projection in the VP.

III. Empirical generalisations about F-projection in VP

Focus may be projected from the rightmost argument to the predicate. If this argument fails to receive the accent because of semantic or discourse dependent reasons, then focus moves to another argument within the VP. If there is none, focus moves of the head of the respective constituent.

It is pretty obvious that these generalisations should not be regarded as belonging to the focus rules themselves. They rather should follow from the focus rules and perhaps some other grammatical principles.

Before we conclude this section, we want to draw attention to another fact. It is not enough to say that the focus is inherited by an argument: also the type of the argument matters.

There seems to be a rule or at least a strong tendency which may be expressed as the following slogan:

IV. No focus to external arguments.

This rule presupposes the external-internal argument distinction. The terminology goes back to Williams [1980] and roughly means this.

An external argument is a D-structure subject, a "logical subject".

Arguments which are not external are called internal. We will denote external arguments by "Arg" and internal ones by "Arg" (William's notation).

In a configurational approach to grammar, the external argument is always outside the phrase which is its predicate, whereas the internal argument is inside. The necessity of a principle like (IV) was first brought to our attention by Angelika Kratzer (personal communication). The principle is borne out by data like the following, all 'out to the blue' utterances.

(30) Xenia promovIERT.

Arg

(31) Die SCHEUNE hat gebrannt

Arg

(32) OTTO kommt

Arg

(33) Ede wird PROFESSOR

Arg

(30) has an agentive main verb. Therefore, the focus can't go to the subject, which is an external argument. (31) and (32) are ergative verbs in the sense of Burzio [1981], that is, in a configurational theory, the surface subject is a D-structure object. In other words, the D-structure pair of (32) would be something like:

(34)(i) $\{ e[\text{Otto kommt}] \text{INFL} \}$

(ii) $\{ \text{Otto}_i [t_i \text{ kommt}] \text{INFL} \}$

Although we are not advocating an analysis of (33) along these lines, i.e. we are not assuming NP-movement for the generation of the S-structure of (33), we do believe that the distinction between external and internal arguments has to be made somewhere, because its reality is reflected in possible focus inheritance. So we assume this distinction to be a primitive, as Edwin William does.

The principle (IV) "Don't focus external arguments" is borne out by data which remain puzzling for Selkirk. Consider her sentences (S. here repeated as

(35) The SUN is shining

(36) My UMBRELLA's been found

(37) My MOTHER's coming

Selkirk argues correctly that all these are perfect "out of the blue" utterances. But she can't explain this fact, because in her system F can never be projected out of a VP, and the projection of the F from a subject is not possible, because S's are not considered as predicates. In our account these data present no problem. Projection from an argument to a higher constituent is possible, if the argument is not external.

Now, perhaps all these sentences have ergative main verbs. Coming certainly is ergative. It is not so clear whether "empty verbs" like shining may be regarded as ergative as well. But let us assume that they can. Find, is not ergative in itself, but clearly the passive form of find is: My umbrella is a deep structure object, given the raising analysis of the verbal passive. In other words, the focus inheritance exemplified by (36) is in accordance with the standard analysis, viz.

(36)(i) [My UMBRELLA_i INFL t_i's been found]
S
Arg

Selkirk would have realized the overgeneralisation of her phrasal focus rule by contrasting the following two sentences:

(38) OTTO kommt
Arg

(39) OTTO geigt
Arg

(38) is a perfect out of the blue realization, because its subject is an internal argument. But (39) is not possible as an out of the blue utterance, because this time, Otto is an external argument. The situation is reversed, if we accent the predicate:

(40) Otto KOMMT
Arg

(41) Otto GEIGT
Arg

The principle that F has to go to an argument together with the principle that external arguments must not be focussed entail these facts.

Despite of our criticism of details, we agree entirely with Selkirk on the view that the relevant information for describing the F-PA-relation is contained in the argument structure. This view makes it possible to explain some rather puzzling facts. Consider the patterns of the following answers.

(42) Haben Sie noch etwas hinzuzufügen?

(i) Ja, ich habe meinen ANWALT belogen.

(ii) Ja, ich habe NIEMANDEN belogen.

(iii) Ja, ich habe jemanden BELOGEN

(43) Gibt's was Besonderes?

(i) Ja, Ede hat ein BUCH geschrieben.

(ii) Nein, Ede hat NICHTS geschrieben.

(iii) Ja, Ede hat etwas GESCHRIEBEN.

What we see here, is that jemand und etwas can't have the status of arguments, because they fail to receive a pitch accent in these minimal dialogs. One possible explanation is that they are 'substitutes for argument' or 'dummies', rather than proper arguments. They fill a syntactical slot without filling it at the same time semantically. The focus feature therefore chooses the next constituent in the hierarchical order of our empirical generalisation (I the head of the VP, which is then the verb, for the realization of the pitch accent.

What then about niemand and nichts ? These NPs do carry pitch accents. Are they arguments then? It would be very strange if they were, although their unnegated counterparts are not. We think that nothing forces us to the view that they are arguments. Nichts and niemand are the cohesive forms of nicht + etwas and nicht + jemand (vide Bech [1955, p. 77]). The decomposed forms consist of 2 elements, negative element plus a non-argument. We have to decompose cohesive forms as soon as we consider so called incoherent constructions:

- (44) Wünschen Sie, noch etwas hinzuzufügen?
(i) NEIN, ich möchte NICHTS mehr hinzuzufügen.
(ii) NEIN, ich wünsche NICHT, noch etwas hinzuzufügen.

(44)(i) and (ii) are virtually synonymous . We may therefore assume that the F-structure is identical in its essential aspects. It is clear then from these data that we need not necessarily assume that nichts is an argument. The focus carrier rather is the negative element nicht, which is explicit in the incoherent construction (44)(ii), where the cohesive form nichts is split up into nicht + etwas. And the negative element is a normal focus carrier, whereas the non-argument etwas isn't.

Notice by the way that Selkirk's theory has nothing to say about the fact that the pitch accent of an negative out of the blue sentence typically goes to the negation. Clearly some functional explanation is required in order to account for this fact.

These remarks conclude our critical discussion of Selkirk's focus rules. In the next section we will try to give an account of our view of how the F-PA-relation should be described in principle.

5. The Focus-Pitch Accent Relation

Let us summarize what we know so far about focus inheritance.

First : Focus is determined by a focussing operator.

Second: Focus as a word is realized by a pitch accent on the most prominent syllable.

Third: Focus goes to an argument

Fourth: Focus goes to the rightmost argument.

Fifth: Focus avoids external arguments.

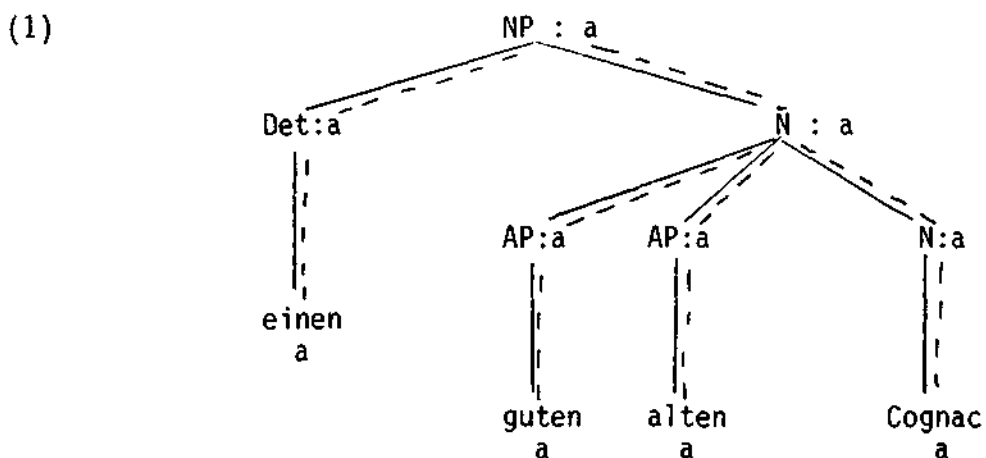
Sixth: Focus avoids pragmatically salient arguments.

It may be the case that some of these principles follow from deeper, simpler principles. It furthermore could be that only some of these principles are grammatical principles, whereas others are discourse principles. At the present stage of research, we will, however, not try to elaborate such distinctions. We will rather call all these principles focus rules.

If we use the metaphor of focus inheritance, then we are adopting a "top to bottom" perspective. Since the F-PA-relation is a relation, we could have described it the other way round, too, i.e. as Selkirk does. We think, however, that the top-down procedure is a bit more suggestive, because the conceptual origin of the F-PA-relation is the "highest" F assigned to a constituent by an operator on the S-structure or perhaps even on the D-structure.

It should also be obvious from the preceding remarks that only the highest F is important for the semantic interpretation. It marks arguments of an operator. The intermediate F's are technical devices only serving the purpose of defining the F-PA-relation. In analogy to feature spreading (case-, gender-, number spreading etc.), we may speak of F-spreading.

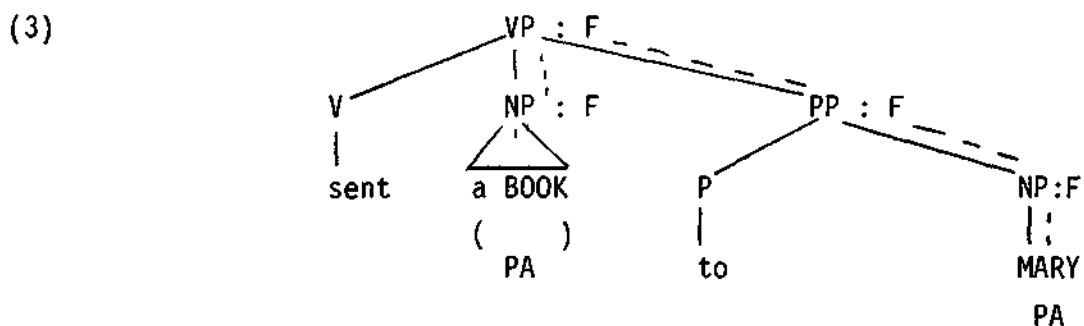
And this analogy is perhaps a fruitful one. Consider for instance the following NP:



The feature accusative (a) is realized morphologically at four different places of the NP, it spreads over the constituents. In analogy, we may ask whether there is focus spreading. We believe that it is at least worth seriously considering such an idea. Recall our example (10) from the last section, here repeated as

(2) She sent a BOOK to MARY

The analysis (10 i) in section 4 we have proposed for this sentence assumes indeed F-spreading. We repeat it here as



The question that arises immediately is this: If there is F-spreading, which principles does it obey?

The principle we will tentatively propose is the following one:

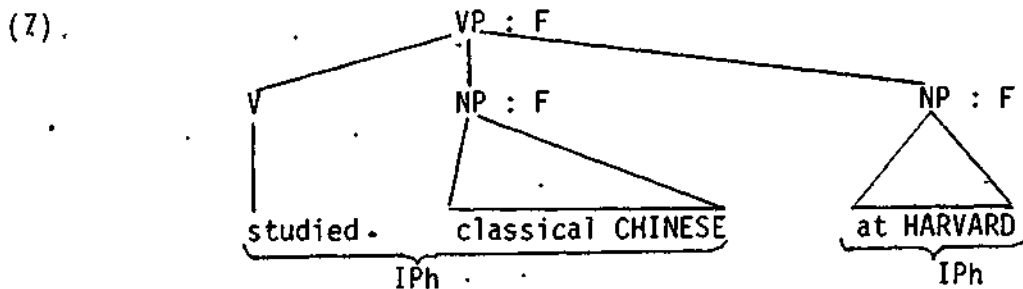
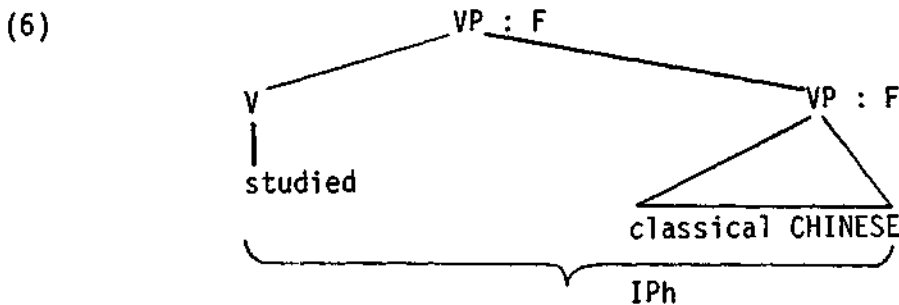
Seventh: Focus spreads to every intonational phrase it immediately dominates.

Before we discuss the theoretical impact of this principle, we will illustrate it with some more examples.

Ladd [1983] discusses, following Gussenhoven [1983], examples like these:

- (4) She even studied classical CHINESE
- (5) She even studied classical CHINESE at HARVARD

"even" is a focussing particle and we will assume that it focusses on the entire VP in these cases. According to our principle VII (and III and IV), the F-structures of the VPs will then be (6) and (7) respectively.



If this theory of focus spreading is correct then it has an important consequence for the organisation of the phonological rules. When we sketched the ordering of the phonological rules we mentioned that Selkirk assumes that the focus rules apply before the rules of intonational phrasing. This means that the focus rules can't "see" intonational phrases (IPh's). Now we have assumed, that they must see IPh's, because it is IPh's that govern focus spreading. Therefore, either the focus rules apply after the rules of intonational phrasing or there is no such thing as focus spreading or focus spreading has to be explained in a different way.

We will assume principle VII and therefore assume that the rules of intonational phrasing apply before the focus rules. It seems to us that this view is in agreement with Selkirk's assumption that intonational phrases are defined "functionally" in the sense of argument structure. Recall that they must form "sense units" defined by the predicate-argument relation, the modifier-modificatum relation and the like. Given that we can distinguish between external and internal arguments, the IPh's contain all relevant information needed to allow our seven focus rules to work.

From what we have said, it follows that trees like (6) and (7) can't be the proper representations of the structures the focus rules work on. We should have intonational phrases instead supplied with the relevant "functional" information. We will, however, not try to elaborate the proper way of representing the information relevant for the focus rules here.

We would like to conclude our paper by looking at some more examples.

(8) Was ist Los? Peter schmelzt das Gold

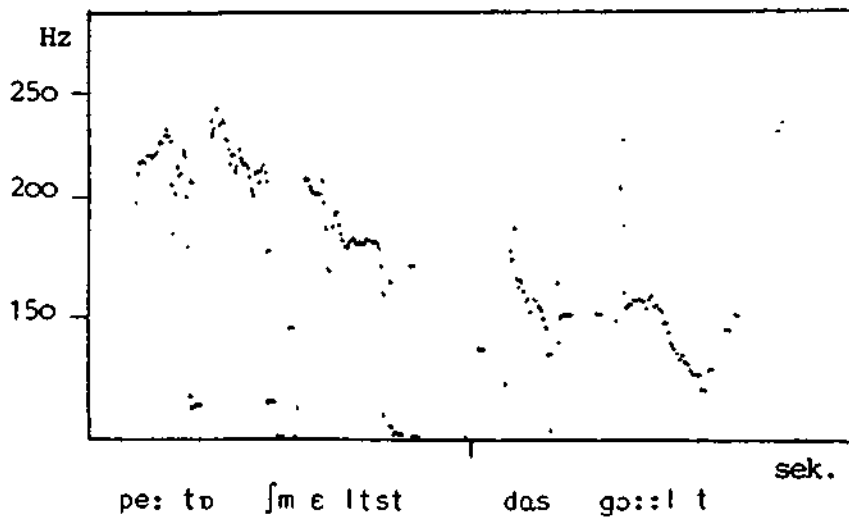
(8)(i) PA PA PA
[[Peter] [schmelzt] [das Gold]
Arg. Pred. Arg.

(8)(ii)

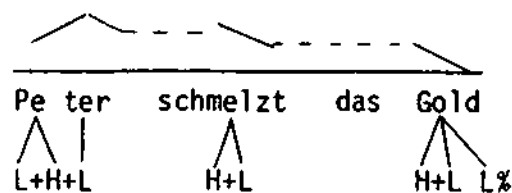
PA / (L)+H+L /	PA [H+L]	PA [H+L L%]
↓	↓	↓
x	x	x
x x	x	x x
x x	x	x x
Pe ter	schmelzt	das Gold

This is an "out of the blue" answer, *i.e.*, we may assume the broadest focus possible. Here the answer is split into three intonational phrases. Therefore we have three pitch accents. The NSR (or some other principle) makes sure that the last PA is the most prominent. The following two figures illustrate the fundamental frequency of the utterance and its stylized contour.

(8)(iii)



(8)(iv)



This example is an extreme case. Informants will typically adopt a strategy of parsing into a maximum of IPh's if they are not yet used to the situation. It is a sort of "safety first" strategy.

The next example shows an utterance with broad focus which is passed into two IPh's.

- (9) A: Gibt's was Neues?
 B: Ja. Rainer liebt Maria.

Focus structure with focal domains and semantic information:

- (9)(i) PA PA
 [[Rainer]][liebt Maria]]
 F F F
 Arg. Pred.+Arg.

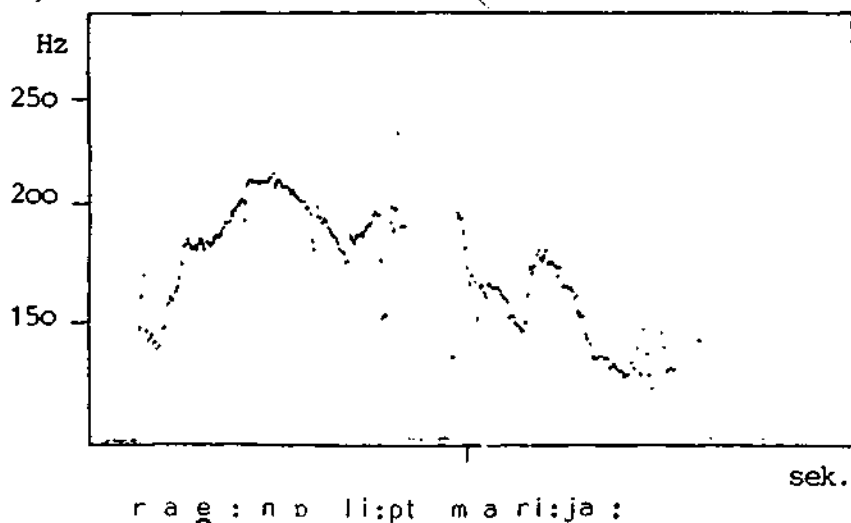
On the level of the metrical grid, we have something like

(9)(ii)

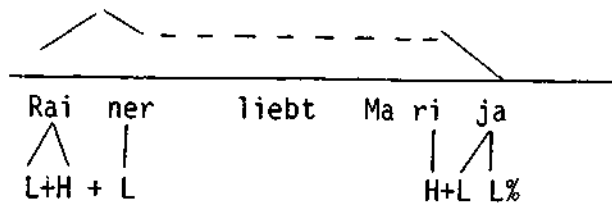
PA/(L)+H+L/ ↓ x. x x x x x	PA/H+L L%/ ↓ x x x x x x x x
Rai ner	liebt Ma ri ja

Fundamental Frequency:

- (9)(iii)



Stylized contour:
(9)(iv)



It is interesting to notice that, in this and the preceding examples, the focus also spreads to the external argument. Thus, focus spreading doesn't respect the restriction that F avoids the external argument (= principle V).

There may be other cases where principles governing F-spreading are in conflict with each other. In such case we must resolve the conflict according to principles stating the priority of some principles over others. It would be interesting if these principles were similar to those which govern the solution of conflicts which arise in morphology, when we have incompatible features to be projected. This would establish a further analogy between focus- and feature spreading. However, we leave the question of the precise nature of the interplay of the focus rules open for further research.

Clearly there is much more to say about the focus rules. Our list is almost certainly not complete. When we composed this article, we were not yet acquainted with Gussenhoven's extremely stimulating paper. His classification of sentences according to the features [\pm eventive] and [\pm contingent] must be respected for an appropriate formulation of the focus rules. The same is true of what Gussenhoven says about adverbials ("conditions"). We have left out that area completely. We haven't said anything about the relevant data. Furthermore, we have not touched the complex of how movement rules, especially topicalisation, restrict focus-assignment. Vide for this again Gussenhoven [1983] and the paper of Haider in this volume.

Finally, it is not clear whether our rules are adequate. Our principle five suggests that it is enough to distinguish between internal and external arguments. But things may turn out to be more subtle. Perhaps it is not exactly the external-internal distinction that matters. But we believe that some distinction between different kinds of arguments is important.

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