Interpreting Second Occurrence Focus

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This manuscript investigates the question of whether and how 'second occurrence focus' (SOF) is realized phonetically in German. The apparent lack of phonetic marking on SOF has raised much discussion on the semantic theory of focus (Partee, 1991; Rooth, 1992). Some researchers have reported the existence of phonetic marking of SOF (Rooth, 1996; Beaver et al., 2004), claiming that SOF is not marked by pitch, but by duration, although it is very subtle at best. These studies, however, overlook the fact that SOF in their examples always appears at a postnuclear position, where no pitch accent can appear for an independent reason. That is, the lack of pitch accent on SOF is not due to the lack of F-marking, but due to the phonological condition where SOF appears. In our experimental study with German sentences, we examined sentences with prenuclear SOF and those with postnuclear SOF, comparing with their first occurrence focus (FOF) and non-focus counterparts. The results show the phonetic marking of SOF in pitch and duration prenuclearly, but only in duration postnuclearly. Furthermore, SOF is realized differently from FOF. We account for these differences by considering several phonetic effects, those that are focus-related and those that are independently motivated.

Keywords: Second Occurrence Focus (SOF), German, prosody

1 Introduction

In this paper, we investigate the question whether and how 'second occurrence focus' (SOF) is realized phonetically in German. We show that the best place to look for phonetic correlates of SOF in sentences is the prenuclear location: there, accents are realized with an increase in pitch. The phonetic realization of SOF is related to the question of the interface between LF and PF in grammar.

After an overview of the theoretical issues of SOF and a presentation of problems for the model of grammar in the next section, experimental methods

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and results are discussed in sections 3 and 4, respectively. A discussion follows in section 5. The paper ends with a conclusion in section 6.

2 Theoretical Background

The phenomenon of second occurrence focus (SOF) was first described by Partee (1999:215-216) in the following terms:

> If *only* is a focus sensitive operator (i.e., needs an intonationally prominent element in its scope) then the two occurrences of *only eats vegetables* in [(1)] should have the same analysis. However, if there is no phonological reflex of focus in the second occurrence of *vegetables* then this leads to the notion of "phonologically invisible focus." The notion of inaudible foci "at best would force the recognition of a multiplicity of different notions of 'focus' and at worst might lead to a fundamentally incoherent notion of focus.

(1) a. Everyone already knew that Mary only eats $[\text{vegetables}]_F$

b. If even $[\text{Paul}]_F$ knew that Mary only eats $[\text{vegetables}]_{SOF}$, then he should have suggested a different restaurant.

Partee indirectly assumes an obligatory phonetic realization of focus. If there are foci without accents, no coherent notion of focus can be obtained. As Krifka (2004:190) puts it (his Hypothesis I): "If an operator is analyzed as focus-sensitive (i.e., associated with a focus) in one type of use, it must be analyzed as focus-sensitive (associated with a focus) in all types of use." Association with focus, an expression coined by Jackendoff (1972), means explicitly that certain expressions have a focus in their syntactic domain, where focus is specified by a syntactic feature F, which in turn is realized by intonational prominence. The conclusion one has to draw from Partee's comment is that if there is no phonological correlate on a SOF, then there is also no focus.

Following Rooth (1992, 1999), Beaver et al. (2004), as well as Bartels (2004), von Fintel (2004), and Krifka (2004) distinguish (though not necessarily with the same terminology) between two types of theories of focus: 'weak' grammaticized theories of focus, which need both a focus-marking F and a phonological (and phonetic) realization of focus, and 'strong' theories of focus, in which the relationship between focus and grammar functions in a more lax manner, and resolution of focus is pragmatic. In the latter view, the quantificational domains of some operators may be restricted contextually or situationally. This model predicts that focus can be left phonetically unrealized, since focus does not need to be grammatically marked. All the authors assume that the phonetic realization of focus is crucial for deciding between the semantic theories. Krifka (2004) takes for granted Partee's claim that SOF is 'inaudible', but other authors, like Rooth (1996), Bartels (2004) and Beaver et al. (2004) answer Partee's challenge by proving that SOF is phonetically realized. The different opinions correlate with different views about strong and weak interpretations of focus.

Rooth, Bartels and Beaver et al. have conducted experiments to investigate whether SOF expressions are realized phonetically. An example of the experimental material used by Beaver et al. to show the phonetic realization of SOF appears in (2) and (3).

(2) a. Both Sid and his accomplices should have been named in this morning's court session.

b. But the defendant only named $[\text{Sid}]_{F}$ in court today.

c. Even $[\text{the state prosecutor}]_{F}$ only named $[\text{Sid}]_{SOF}$ in court today.

(3) a. Defense and Prosecution had agreed to implicate Sid both in court and on television.

b. Still, the defense attorney only named Sid [in court]$_F$ today.

c. Even [the state prosecutor]$_F$ only named Sid [in court]$_{SOF}$ today.

In the examples above, the areas of interest are both the first and the second postverbal phrases (NP *Sid* and PP *in court*) of the last sentence in a discourse. The (a) sentence first introduces a context in which both phrases are new. Then the (b) sentence introduces a context in which one of the phrases is a first occurrence focus (FOF)—*Sid* in (2), and *in court* in (3)—and the other one is in the background. In (c), the FOF in (b) is now SOF and the other phrase is still part of the background. The SOF effect is obtained by realizing a new focus in (c) (*the state prosecutor*) with a nuclear pitch accent, and by simply repeating the postverbal phrases. But, since one of them is still in the restrictor of the 'old' focus operator *only*, it is still focused. The phonetic realization of this focus, however, is much more subtle than that of FOF in the (b) examples, and hence, raises the question formulated by Partee. The researchers mentioned above (Rooth 1996, Bartels 2004, Beaver et al. 2004) all find some phonetic correlates of focus, though no pitch accent.

In the remainder of this section, we first address the question of the phonetic correlates of SOF. We show that the problem has not been approached correctly in the experiments cited above. The second question has to do with the impact of the phonetic facts for the model of grammar, and more specifically, whether it is correct to base a semantic theory on the presence or absence of phonetic correlates of SOF.

2.1 Phonetic Correlates of SOF

In an utterance like (2c), repeated as (4B), the SOF *Sid* is a focus by virtue of being associated with a focus operator, but crucially, it is embedded in a larger expression which is itself in the background, or discourse-given, which is usually realized in a lower pitch than discourse-new material (cf. Sugahara 2003). The SOF results from the conflict of being focused and being backgrounded. The question which all experiments on SOF have explicitly or implicitly attempted to answer, is whether the correlates of focus associated with a focus operator can override the lowered pitch contour observed in a backgrounded string of words.

(4) A: But the defendant only named $[\text{Sid}]_{F}$ in court today.

B: $[\text{Even } [\text{the state prosecutor}]_{FOF}]_{Focus}$ [only named $[\text{Sid}]_{SOF}$ in court today]$_{backgrounded}$

Rooth (1996), Bartels (2004) and Beaver et al (2004) find no or only a very slight increase in pitch on the SOF as compared to the counterparts in the minimal pair examples. They find instead other phonetic correlates, like a small increase in duration (an average of 6ms in Beaver et al.), and a very slight (non-significant in Beaver et al.) increase in intensity and in the f0-range in the second occurrence focus condition as compared to the same word in a non-focused position. On the basis of these results, all the authors conclude that the prominence on SOF is different from a plain pitch accent. Rooth calls it a 'metrical accent', and Beaver et al. a 'phrasal stress', which they say formally differs from pitch accent. According to them, focus is marked both by phrasal stress and a nuclear pitch accent, whereas SOF is marked only by phrasal stress.

There is, however, another important factor that has to be considered in the discussion. The seeming difference between the kind of accent needed for

FOF and the one needed for SOF is a consequence of the fact that the prominence on SOF was searched for at a suboptimal place, namely in a postnuclear position. Postnuclear material is subject to a *deaccenting* effect that is independent of its information structural status. We will show below that in a prenuclear position, there is pitch prominence on SOF as compared to non-focused counterpart. Our experiment was conducted with German data, but we expect that our general conclusions are valid for English as well, since those aspects of intonation which bear on SOF are similar in both languages.

Independently of our experimental results to be presented in sections 3 to 5, there are also a few other pieces of evidence showing that SOF is phonetically marked. Von Fintel (2004), Rooth (1996) and Krifka (2004) mention the absence of weak pronouns in a SOF location as another important clue for the special status of these items.[1] Second Occurrence Focus on a pronoun blocks cliticization. Compare the data in (5). The sentences in (b) and (c) are SOF. As shown in (5c) the cliticized rendition of the pronoun is not possible in this context. This set of data is relevant for the discussion of whether SOF is accented or not, despite the absence of pitch accent, and seems to indicate that it is.

(5) Pronouns

a. Mary's boyfriend only likes her

b. Even her boss only likes her

c. # Even her boss only likser

[1] Rooth attributes this observation to Susanne Tunstall.

As discussed most clearly by Rooth (2004:480), the SOF sentences are to be considered in their context. They involve two foci embedded in each other, and a phonetically repeated sentence. Rooth shows, with sentences like those in (6), that SOF is not just a matter of syntactic parallelism, involving repeated phonetic material. New material in (6B) can stand for first occurrence focused constituents in (6A). The point is important because it eliminates analyses relying on the mere copying of phonological material.

(6) A: The provost and the dean aren't taking any candidates other than Susan and Harold seriously.

B: Even the [CHAIRman]$_F$ is only considering [younger]$_{SOF}$ candidates.

2.2 Can Phonetic Facts decide between Semantic Theories?

It is important to pin down the phonetic and phonological correlates of SOF, since the argument of its being accented or not has been crucial in the discussion about the best interpretation of focus. The accent status of SOF has been considered a major argument for deciding between weak and strong theories of semantic focus. In weak versions, *only* is a focus operator, and as such, it is expected to be associated with an element bearing an accent. If there is no accent on the element on which it takes scope, two solutions are possible. The first one is to claim that *only* has at least two interpretations, one associated with focus, and the other one not. This is the worst case, which no researcher has been willing to defend (see Partee's comment). The other interpretation implies giving up the obligatoriness of association with focus, and endorsing the view that it is optional. In this latter solution, the domain of quantification is based on pragmatic reasoning, like letting contextual factors play a role. A sentence like (7), for example, does not mean that there is no sunshine on earth, but has to be understood as a comment on a contextually given place in which the speaker is

located, or on which she has some knowledge. In other words, the restrictor of the quantifier *no sunshine* is further restricted by the context of utterance.

(7) There is no sunshine.

The 'strong' theory of focus assumes that focus operators are like quantifiers and that their domain can be restricted by context and only by context. Rooth shows with the help of examples like (8a) that the domain of *only* can be fixed by the context variable of the preceding expression. As a result, accents on elements in the scope of a focus operator may be absent. In (8a), *rice* in the main clause is expected to be focused because it is associated with *only*. Thus it should have an accent. But instead, an accent is present on *eat* because of the contrast with *grow*. The explanation for the absence of an accent on *rice* is that the domain of quantification is pragmatically driven. This happens entirely without the help of focus. The context of *grow rice* and the context of *eat rice* are anaphorically related, and define a given environment for each other. Rooth assumes that there is no focus on *rice*, and takes this fact as evidence that focus-sensitive effects are optional.

(8) a. People who $[\text{grow}]_F$ rice usually only $[\text{eat}]_F$ rice.

b. People who $[\text{grow}]_F$ rice that absorbs a lot of water usually only $[\text{eat}]_F$ rice that absorbs a lot of water.

The discussion regarding the strong/weak theories of focus is based on a tacit assumption that focus is *always* phonetically marked. Given this assumption, if no phonetic marking is found on a phrase, it has to be treated as a non-focused element. Association with focus, or the lack thereof, has been judged based on the existence/absence of phonetic marking (in most cases, pitch accent) on the phrase that is in the quantificational domain of focus operators. It should be

noted, however, that the phonetic marking of focus can be masked by independent phonetic/phonological effects. Rooth's explanation for the absence of accent on *rice* predicts that if this noun is expanded with a relative clause like *that absorbs a lot of water*, the entire complex noun phrase should be deaccented in both clauses, since the anaphoric effect he postulates on the context should be observed in the larger NP as well. This does not seem to be true though, since the first occurrence of *water* is preferably accented. In our opinion, there is an alternative explanation for the absence of accent on *rice* in a sentence like (8a), as there could be in the (2) sentences, which has nothing to do with contextual or anaphoric quantification. *Rice* could be deaccented on prosodic grounds (see Féry & Samek-Lodovici, to appear, for such an explanation). In (8a), an accent on *rice* would compete with the accent on *eat*, and the latter one wins because it has an additional contrast value that *rice* does not have. Furthermore, the SOF expressions in (2) could be deaccented because they are found in a postnuclear environment, in which no pitch accent can be realized. We found that deaccenting is a consequence of postnuclearity, a phonological effect that is independent of the focus or non-focus status of SOF, an effect compatible with Rooth's and Beaver et al.'s results. But we also found that SOF expressions are accented when they are prenuclear. As soon as SOF expressions are in a phonological environment where they can be accented, they are accented. This is demonstrated in the next section.

3 Experiment

3.1 Stimuli

All the experiments on SOF we are aware of investigate the occurrence of focus in a postnuclear environment. Our experience of intonation, however, is that postnuclear environments are not the best place to look for differences in pitch

as a consequence of prominence. Reliable occurrences of non-nuclear accents in German and in English are on prenuclear material, in other words, on the material located before the main focus of the sentence. Therefore, in our material, we investigated realizations of SOF in a prenuclear position as well as those in a postnuclear position.

Six expressions, underlined in (9), were chosen as the target expressions. Three of the target expressions (1*x*–3*x*) were inserted in the subject position, and three (4*x*–6*x*) in the object position. Hereafter, we will call the former group the *subject set* and the latter *object set*. Three different focus operators were used in our stimuli: *nur* 'only', *auch* 'also', *sogar* 'even,' as shown in (9).

(9) Stimulus expressions (example numbers corresponding to those in the appendix)

(1*x*) Nur Peter hat eine Krawatte getragen.
only Peter has a tie worn
'Only Peter wore a tie.'

(2*x*) Auch Melina hat beim Aufbau mitgeholfen.
also Melina has at.the assembly helped
'Also Melina helped at the assembly.'

(3*x*) Sogar Monika hat Mailand geliebt.
even Monika has Milan loved
'Even Monika loved Milan.'

(4*x*) Eva hat nur ihren Bruder eingeladen.
Eva has only her brother invited
'Eva only invited her brother.'

(5*x*) Ingo hat auch einen Jaguar gekauft.
Ingo has also a jaguar bought
'Ingo also bought a jaguar.'

(6*x*) Michael hat <u>sogar ein Lied</u> gesungen.
Michael has even a song sung
'Michael even sang a song.'

Each expression is inserted in five different contexts: (i) FOF, (ii) prenuclear SOF, (iii) postnuclear SOF, (iv) prenuclear Non-Focus, and (v) postnuclear Non-Focus context. Thanks to the V2 property of German, we can place SOF and Non-Focus expressions in different locations, either sentence-initially (prefield) or sentence-medially (middle field). When SOF and Non-Focus are in the sentence-initial position, they are followed by a nuclear pitch accent. We call them *prenuclear* SOF and prenuclear Non-Focus, respectively. When they are in the sentence-medial position, they are preceded by a nuclear accent in the sentence-initial position, hence becoming the *postnuclear* SOF/Non-Focus.

One complete set of contexts (from the subject sets) is illustrated in (10). (10a) is the FOF sentence, (10b) and (10c) the SOF sentences. Notice that the context eliciting SOF is identical to the FOF sentence (10a). The SOF in (10b) is located in a prenuclear position, while that of (10c) is located postnuclearly. The (d) and (e) sentences are pre-/postnuclear Non-Focus contexts, respectively, where the target words are already mentioned in the preceding wh-questions, and no focus operator is involved.

(10) Contexts for one of the subject set ((1a)–(1e) in the appendix)

a. FOF
Die meisten unserer Kollegen waren beim Betriebsausflug lässig angezogen.
'Most of our colleagues were dressed casually at the staff outing.'

<u>Nur Peter</u> hat eine Krawatte getragen.
'Only Peter wore a tie.'

b. SOF: Prenuclear
Die meisten unserer Kollegen waren beim Betriebsausflug lässig angezogen. Nur Peter hat eine Krawatte getragen.

Nur Peter hat sogar einen Anzug getragen.
'Only Peter even wore a suit.'

c. SOF: Postnuclear
Die meisten unserer Kollegen waren beim Betriebsausflug lässig angezogen. Nur Peter hat eine Krawatte getragen.

Sogar einen Anzug hat nur Peter getragen.

d. Non-Focus: Prenuclear
Wen hat Peter geküsst? 'Who did Peter kiss?'
Peter hat Maria geküsst. 'Peter kissed Maria.'

e. Non-Focus: Postnuclear
Wen hat Peter geküsst?
Maria hat Peter geküsst.

As for the FOF context, (a) sentences in the subject set (1a–3a in the appendix) contain FOF expressions in a sentence-initial position, while those in the object set (4a–6a) contain FOF expressions in the sentence-medial position. In both cases, FOF bears a nuclear accent since no accent follows in the sentence. One of the sentence-medial FOF examples (i.e., (a) examples in the object set) is given in (11).

(11) FOF context for one of the object sets ((4a) in the appendix)

a. FOF
Viele Frauen haben mehrere Verwandte zum Dorffest eingeladen.
many women have several relatives to.the village fair invited
'Many women have invited several relatives to the village fair.'

Aber Eva hat nur ihren Bruder eingeladen.

In sum, our material has a 2 × 3 factorial design, the two factors being position in the sentence (pre- and postnuclear, or sentence-initial and sentence-medial for FOF) and focus type (FOF, SOF, Non-Focus).

With this material, we will examine the following two hypotheses. First, we expect to find a three-way difference between FOF, SOF, and Non-Focus, FOF being the most prominent and Non-Focus the least (Hypothesis a). Second, we also expect different realizations of the three focus types according to their location in a sentence, the sentence-initial FOF/SOF/Non-Focus being more prominent than the sentence-medial counterparts (Hypothesis b). We use the term 'prominence' as a cover word for both pitch and duration.

(12) Hypotheses

a. FOF words are more prominent than SOF words which are themselves more prominent than Non-Focus words.

b. Sentence-initial words are more prominent than sentence-medial ones.

3.2 Recordings

Recordings were made in a sound-proof booth on a DAT recorder. A short set of instructions familiarized the subjects with the procedure and made them practice with a few examples. The contexts and answers were presented in a PowerPoint presentation, in a series of two slides per stimulus. On the first slide, the context was presented both acoustically and visually, and the target sentence appeared on the second slide. The informant read the sentences as naturally as possible. The experiment was self-paced and the speakers were instructed to repeat the sentences if they felt that they had made a mistake.

The 30 sentences used for this experiment were part of a larger production experiments, including 200 sentences altogether. Each context was organized in one block of the 6 different sentences. The blocks were separated from each other by 17 or 20 other sentences.

Our speakers were 15 female students at the University of Potsdam, chosen out of a set of 29 recorded informants. They were reimbursed for their time. They were monolingual speakers of German in their twenties, coming from the Northern area of Germany. We chose the 15 speakers on the basis of the following criteria: all speakers who made more than one mistake in assigning accents (like realizing a pitch accent on a non-focused item) were eliminated. From the remaining speakers, we excluded those who were less natural and spoke more slowly or more rapidly than the majority. Of the remaining 15 speakers, six realized one erroneous pitch accent as compared to what we expected.

3.3 Measurements

The recordings were analyzed using the acoustic speech analysis software Praat© (Boersma and Weenink 1994–2004). The sound waves were manually divided into labeled sub-strings with the help of spectrograms. The divisions assigned one or two domains of measurements, depending on whether there was an article (or a possessive) preceding the target noun, as illustrated in (13b). In (13a) only one domain was defined, whereas in (13b), two were needed. The measurement on the article was necessary because in many cases, the falling nuclear accent started on the syllable preceding the accented syllable, a phenomenon called 'early peak.' This is well documented in the literature on German intonation (Kohler 1990), and it is visible in Fig. 1ii below.

(13) a. Nur # Peter # hat sogar einen Anzug getragen.

b. Auch Eva hat nur # ihren # Bruder # eingeladen.

Two values were measured. First, the highest peak of the domain defined by the target noun (plus the preceding article when present), and second the duration of the target noun (not including the article). The values were assigned by a script in Praat, but the authors manually verified all the sentences. In approximately 30% of the cases, changes were necessary because of microprosodic distortions in the pitch-tracks (especially in the noun *Peter* and *Monika*). Statistic analyses were done using the statistical computing environment R.

4 Results

Figure 1 illustrates examples of realizations for the six contexts: (i) sentence-initial FOF, (ii) sentence-medial FOF, (iii) prenuclear SOF, (iv) postnuclear SOF, (v) prenuclear Non-Focus, and (vi) postnuclear Non-Focus. From these pitch tracks one can see that sentence-initial/medial FOF (i.e., nuclear elements) (i, ii) as well as prenuclear SOF/Non-Focus (iii, v) preserve accents of the target expression (*Peter*, *Bruder*), but that this is not true for postnuclear SOF/Non-Focus (iv, vi).

Figure 1-i: FOF: Sentence-initial

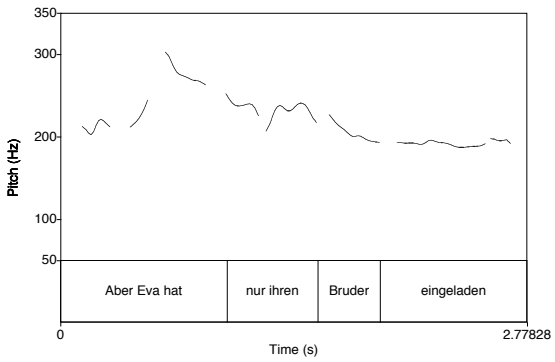


Figure 1-ii: FOF: Sentence-medial

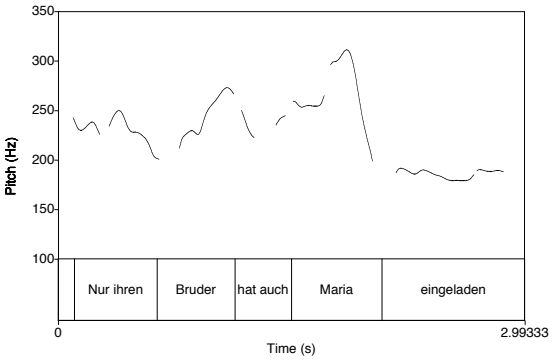


Figure 1-iii: SOF: Prenuclear

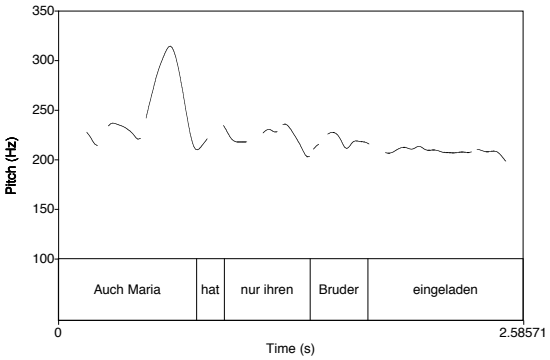


Figure 1-iv: SOF: Postnuclear

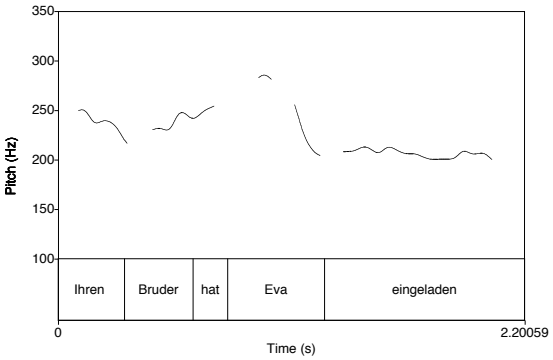


Figure 1-v: Non-Focus: Prenuclear

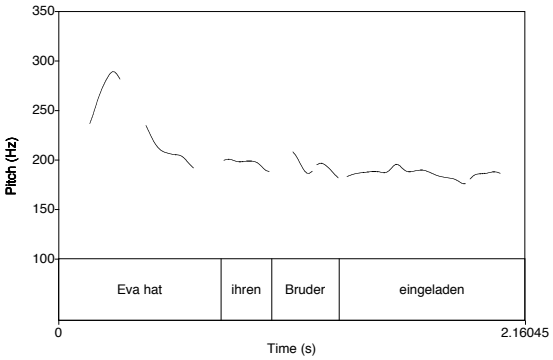


Figure 1-vi: Non-Focus: Postnuclear

Figure 1: Pitch tracks of the six conditions (1a, 4a–e in the appendix) by one speaker

4.1 Pitch (F0)

Figure 2 shows the mean highest F0 on the target expression for each context. The darker bars are for the sentence-initial/prenuclear contexts, the lighter ones for the sentence-medial/postnuclear sentences.[2]

[2] Note that we measured only the target expression in each sentence. Therefore the results in Figure 2 do NOT indicate the relative height between FOF and SOF in the same sentence (e.g., *Anzug* and *Peter* in (10b,c)), or the one between FOF and Non-Focus (e.g., *Maria* and *Peter* in (10d,e)).

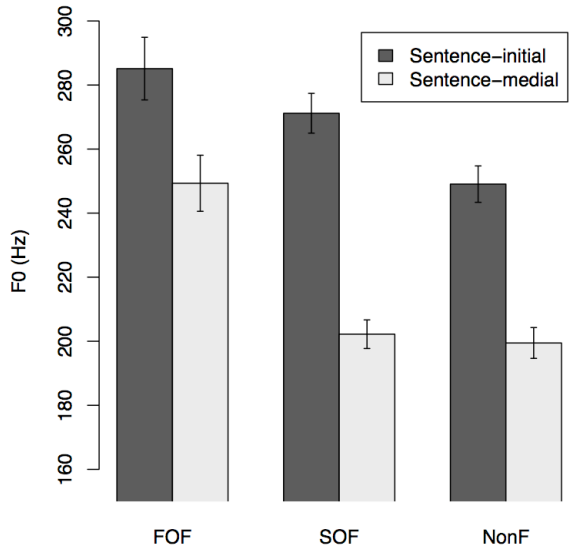


Figure 2: Mean F0 for FOF/SOF/Non-Focus in sentence-initial/medial conditions (with 95% CI)

Comparing the three sentence-initial contexts in Figure 2 (dark bars), our first hypothesis (12a) regarding the three-way contrast among FOF, SOF, and Non-Focus is confirmed. Sentence-initially, (nuclear) FOF is realized higher than prenuclear SOF, which itself is realized higher than prenuclear Non-Focus. The contrast between FOF and SOF is statistically significant (one sided t-test, $t(133) = 2.4917$, $p = 0.00697$), as is the contrast between SOF and Non-Focus (one sided t-test, $t(178) = 5.2187$, $p = 2.490e\text{-}07$).

In the sentence-medial contexts (light bars in Figure 2), however, the contrast between the two postnuclear elements, SOF and Non-Focus, is no longer detectable. The contrast is statistically not significant (one sided t-test, $t(178) = 0.8292$, $p = 0.2040$). This fact appears to indicate that Hypothesis a does not hold in a postnuclear context.

In an information structurally neutral (‘all-new’) context, the rightmost stressed syllable in the utterance bears the nuclear stress, and attracts the nuclear pitch accent. When a narrow focus (i.e., FOF) is assigned somewhere else, it is this FOF which attracts the nuclear pitch accent. In such cases, all the following

pitch accents are lost. In other words, no postnuclear word can bear a pitch accent. We call this effect *postnuclear deaccenting*.[3]

This is exactly what happens to postnuclear SOF and Non-Focus. Postnuclear deaccenting on the postnuclear SOF and Non-Focus obliterates the expected contrast between them.

This is also the reason why the contrasts between FOF and the other two contexts (SOF/Non-Focus) are much larger sentence-medially than sentence-initially. In the sentence-medial position, FOF bears the nuclear accent, while postnuclear SOF/Non-Focus are deaccented. In the sentence-initial position, on the other hand, FOF, prenuclear SOF, and prenuclear Non-Focus are all accented.

We can deduce that the sentence-initial contrast is a pure effect due to the difference of the focus type, while the sentence-medial contrast is a combination of focus type effect and postnuclear deaccenting. (We will see in the next section that postnuclear SOF is phonetically marked for at least duration, which means that it does bear some kind of accent).

In Figure 2, we also see that our second hypothesis (12b), concerning the difference between pre- and postnuclear accent realization, is confirmed: In all three focus types, sentence-initial expressions are realized higher than their sentence-medial counterparts. As for the SOF contexts, the mean difference between pre- and postnuclear SOF is statistically significant (one sided t-test, $t(161.627) = 17.9179$, $p < 2.2e\text{-}16$). The same is true for Non-Focus: the mean difference between the pre- and postnuclear Non-Focus is statistically significant (one sided t-test, $t(178) = 13.2299$, $p < 2.2e\text{-}16$).

[3] A similar phenomenon is also observed in Japanese. When a phrase receives a narrow focus interpretation, an F0-boosting is observed on the focused phrase, and pitch contour of all the following phrases are compressed. See Ishihara 2004 and references therein.

The contrast between sentence-initial and sentence-medial FOF is also statistically significant (one sided t-test, t(88) = 5.4936, p = 1.889e-07). Recall, however, that the FOF data are not involved in pre-/postnuclearity contrast, because FOF always bears a nuclear accent. Instead, the difference in prominence is due to downstep. In the course of a sentence, accents are downstepped relatively to immediately preceding ones (see Truckenbrodt & Féry, 2004 and Féry & Truckenbrodt 2005). A pitch accent later in a sentence is therefore realized lower than a sentence-initial pitch accent. Accordingly, sentence-initial FOF is realized higher than sentence-medial FOF. Downstep is illustrated schematically in (14).

(14) Downstep

In sum, we have found the following for pitch (15):

(15) Summary for pitch

a. Hypothesis a (focus type):
In a sentence-initial/prenuclear position, the focus type hierarchy (FOF > SOF > Non-Focus) was establishedfor pitch.
In a sentence-medial/postnuclear position, the contrast between SOF and Non-Focus is obliterated by deaccenting.

b. Hypothesis b (sentence position):
Sentence-initial FOF is realized higher than sentence-medial FOF, due to downstep.
Prenuclear SOF/Non-Focus is realized higher than postnuclear SOF/Non-Focus, due to postnuclear deaccenting.

4.2 Duration

Since we have target expressions with different numbers of syllables (3 syllables for *Monika*, *Melina* and *Jaguar*[4], 2 for *Peter* and *Bruder*, 1 for *Lied*), we performed a regression analysis to factor out the effect of syllable length on duration. Figure 3 shows the mean residual durations for FOF, SOF, and Non-Focus, both in sentence-initial and in sentence-medial position. The higher residual value indicates the longer duration (i.e., the negative value found for Non-Focus is of shorter duration than the positive ones for FOF and SOF).

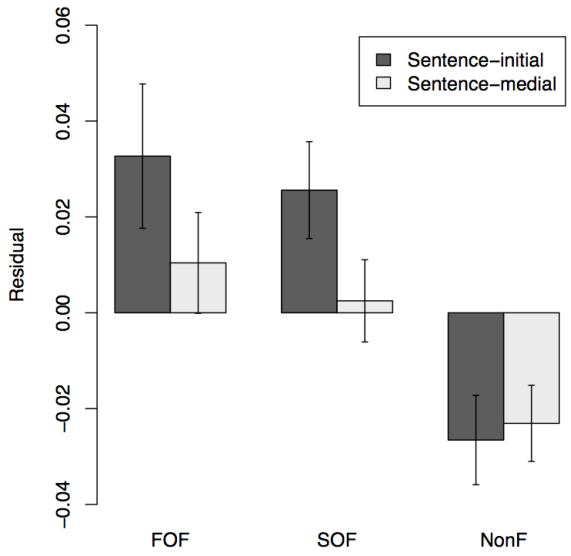


Figure 3: Mean residual duration for FOF/SOF/Non-Focus in sentence-initial/medial contexts (with 95% CI)

Let us first consider the result in terms of Hypothesis a (i.e., FOF > SOF > Non-Focus hierarchy). In the case of duration, the SOF > Non-Focus hierarchy is confirmed both in prenuclear and postnuclear contexts, unlike pitch, for which

[4] A word like *Jaguar* with a hiatus between the second and third syllable can be pronounced as a bi- or a trisyllabic word. Our measurements speak for a length comparable to a trisyllabic word in our data.

the contrast between SOF and Non-Focus was absent in postnuclear contexts. However, there is no significant difference between FOF and SOF, both sentence-initially and sentence-medially. All results for duration are shown in (16) and (17).

(16) SOF vs. Non-Focus — Significant

a. Prenuclear: one sided t-test, t(176.862) = 7.5345, p = 1.218e-12

b. Postnuclear: one sided t-test, t(176.945) = 4.3461, p = 1.166e-05

(17) FOF vs. SOF — Not significant

a. Sentence-initial: one sided t-test, t(85.171) = 0.7864, p = 0.2169

b. Sentence-medial: one sided t-test, t(101.378) = 1.1694, p= 0.1225

As far as Hypothesis a is concerned, the results suggest the following two points. First, there is always a clear difference in duration between focused (i.e., FOF/SOF) and Non-Focus material, regardless of the sentence position. Second, there is no significant distinction between FOF and SOF, again regardless of sentence position. Remember that in the case of pitch, the contrast between SOF and Non-Focus is absent in the postnuclear context, and that there was a significant difference between FOF and SOF both sentence-initial and sentence-medially. We need to explain these differences between pitch and duration with respect to Hypothesis a. The results suggest that focus has a lengthening effect, and that the strength of this lengthening effect is the same in FOF and SOF. See the next section for discussion.

Let us now examine the pre-/postnuclear contrast (Hypothesis b) in duration. The pre-/postnuclear contrast is statistically significant in FOF (one sided t-test, t(88) = 2.4452, p = 0.008235) and in SOF (one sided t-test,

t(173.415) = 3.462, p = 0.0003376), but not in Non-Focus context (two sided t-test, t(173.576) = -0.5656, p = 0.5724). This result is again different from that of pitch, in which the sentence-initial/medial contrast was significant in all three contexts. Again we need a separate explanation for duration.

The best candidate for the source of this contrast appears to be prosodic phrasing. We observed above that focus has a lengthening effect. This lengthening effect of focus is stronger at the sentence-initial position than later in a sentence.

Focused material (FOF and SOF) in the sentence-initial position tends to form a prosodic phrase of its own (as one can see from Figure 1-i and 1-iii above). As a result, the duration of the material increases, due to phrase-final lengthening. Focused material in the sentence-medial position, on the other hand, is included in a larger prosodic phrase (cf. Figure 1-ii, 1-iv). Accordingly, although it would show a focus-driven lengthening effect, this is not as large as in the sentence-initial position. Non-Focus phrases (both pre- and postnuclear ones) do not form a separate prosodic phrase. Nor do they show a focus-lengthening effect (cf. Figure 1-v, 1-vi).

In sum, we have found the following for duration:

(18) Summary for duration

a. Hypothesis a (focus type):
The contrast in duration is attested only between focused (FOF/SOF) and non-focused (Non-Focus) contexts. No significant difference between FOF and SOF.

b. Hypothesis b (sentence position):
A sentence-initial target is realized longer than a sentence-medial target only in FOF and SOF.

5 Discussion

5.1 Interpretation of the experimental results

Hypothesis a. claims that the focus hierarchy FOF > SOF > Non-Focus is implemented by means of the phonetic correlates of pitch and duration; indeed, this has been confirmed experimentally. Hypothesis b. expects pitch and duration to have a greater effect sentence-initially than sentence-medially. Again, the experimental results confirmed the hypothesis.

Beaver et al. (2004), who only studied postnuclear SOF, find that duration exhibits more reliable cues for SOF than pitch. This is not what we find in general. We find that pitch is more reliable prenuclearly, since pitch height in a SOF expression is lower than in a FOF but higher than in a Non-Focus one. Postnuclearly, however, pitch is not reliable, due to deaccenting. This observation is in line with Rooth's and Beaver et al's results. Additionally, we find that duration only contrasts focused items — both FOF and SOF — with non-focused ones: the former are longer than the latter. We also find an effect of duration depending on the position in the sentence. Early focused items are longer than late ones. Clearly, a new interpretation is needed.

Pitch and duration were implemented differently in our target expressions, but both covaried with the information structure on the one hand, and with the phonology on the other hand. Addressing the correlation with information structure first, the following observations can be made:

(19) Information structure-driven effects

a. focus raises pitch

b. givenness lowers pitch

c. focus triggers longer duration

The first effect — pitch-raising because of focus — was observed sentence-initially. Both FOF and SOF have a higher accent than Non-Focus. But the second effect also lowered pitch when the expression was given, so that the SOF expressions have a lower accent than the FOF. The third effect was visible in that the focused expressions (FOF and SOF) were realized with a longer duration than the non-focused ones. Givenness appears to affect only pitch, but not duration. As a result, we do not observe the duration difference between FOF and SOF.

In addition to these focus-related effects, pitch and duration were also affected by purely phonological factors:

(20) Phonologically-driven effects

a. downstep decreases the height of non-initial accents

b. no pitch accent is realized postnuclearly (postnuclear deaccenting)

c. final lengthening in phonological phrases increases duration

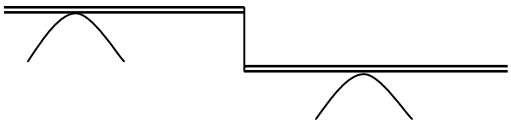
These purely phonological factors obliterate or enhance the focus-related effects in different contexts, creating more variety in the phonetic realization than we would expect if we only assumed focus-driven effects. In the next two subsections, we will discuss how the focus-driven effects and the phonologically-driven effects interact in pitch and duration realization.

5.2 Pitch

If we think of sentences with a neutral focus structure (in which the whole sentence is presentational or ‘all-new’) as having a default pitch contour, we can draw an idealized tonal topline like the one in (21). In the illustrations hereafter, the continuous double lines show the highest value of the default intonation

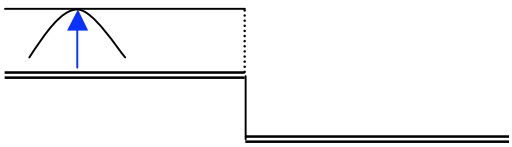
contour, i.e., the level of high accentual peaks. As was shown in (14), a pitch accent is realized on a lower pitch than the preceding one, due to downstep (20a), which causes the step in the contour in (21). The contour is limited to two accents in the illustrations below, since the sentences studied here have maximally two locations for accent, an early one and a late one, and only this kind of pattern is discussed. Note that the form of the accents in the illustrations does not mean anything. We represent it as both a rise and a fall, but it can be just a rise of just a fall. The only important point is the accentual H.

(21) Downstep on non-initial pitch accents (= (20a))



Considering the pitch configuration (21) as the default one, we can now show the effect of narrow focus on pitch as raising the top line. In (22), this is illustrated first for a sentence-initial accent. The continuous double line shows the same value as in (21), but now the high tone of a focus accent is higher than in a sentence without narrow focus, as indicated by the single line. Such a configuration was visible in Figure 1-i above, with a sentence-initial FOF, where there is an early narrow focus.

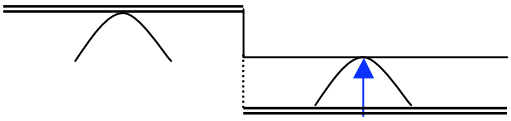
(22) Sentence-initial raising due to narrow focus (= (19a)), see Figure 1-i: sentence-initial FOF



Top line raising because of narrow focus can also take place sentence-medially, as in (23). Such a configuration arose in our data in the sentences with sentence-

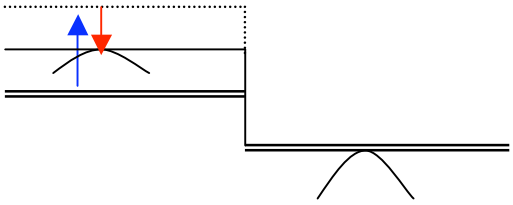
medial FOF (see Fig. 1-ii). The second accent was still clearly lower relative to the first one, under the influence of downstep. Notice that our data do not contain neutral sentences such as illustrated in (21), so that we cannot be completely confident that the raising really took place. But we rely on other studies on German which establish the raising effect of narrow focus on a late accent (see Höhle 1982, Uhmann 1991 among others).

(23) Sentence-medial raising due to narrow focus (= (19a)), see Figure 1-ii: sentence-medial FOF

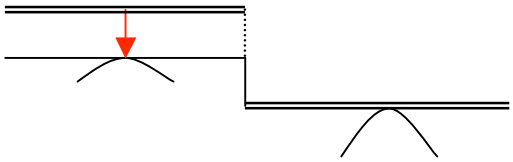


Countervening the raising effect of focus, a lowering effect due to givenness (19b) is also identifiable, as illustrated in (24). Both SOF and Non-Focus are given and thus undergo this effect. For reasons which are explained shortly, the lowering effect due to givenness only takes place in the prenuclear position, i.e, when a nuclear pitch accent follows later in the sentence. A prenuclear SOF is lower than a sentence-initial FOF because it is influenced by both the raising factor shown in (22) and the lowering effect shown in (24). But it is still higher than a prenuclear Non-Focus which undergoes no raising, but only a lowering factor. (24) illustrates a prenuclear SOF (cf. Fig.1-iii) and (25) a prenuclear Non-F (cf. Fig.1-v), respectively.

(24) Sentence-initial raising due to focus (= (19a)) and lowering due to givenness (= (19b)), see Figure 1-iii: prenuclear SOF



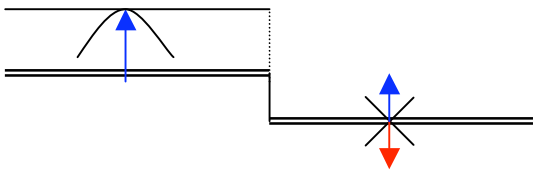
(25) Sentence-initial lowering due to givenness (= (19b)), see Figure 1-v: prenuclear Non-F



If the early accent is raised due to focus and bears the nuclear pitch accent, the potential late accent is not realized due to postnuclear deaccenting in (20b). This is illustrated in (26). Since no accent is realized in the postnuclear position, no raising (or, for that matter, no lowering) can take place. In our examples, the late accent is suppressed due to deaccenting in sentences with initial FOF (Figure 1-i), postnuclear SOF (Figure 1-iv), and postnuclear Non-Focus (Figure 1-vi).

When an early accent is raised and not simultaneously lowered, subsequent accents may be realized. The final one bears the nuclear pitch accent. In our examples, such a case can be found in Figure 1-ii (sentence-medial FOF, where the early accent is neutral, cf. (23)), in Figure 1-iii (prenuclear SOF, where the early accent is both raised and lowered, cf (24)), and in Figure 1-v (prenuclear Non-Focus, where the early accent is lowered, cf. (25)).

(26) Postnuclear deaccenting after nuclear raising (No raising/lowering) (cf. Figure 1-i, iv, vi)



In sum, sentence-initially, focus-driven raising and givenness-driven lowering are both possible, even in combination. The presence of a following accent, on the other hand, depends on the nuclearity status of the preceding accent. If the early accent attracts the nuclear pitch accent under the influence of focus,

deaccenting applies, which means that no accent may follow. Otherwise an accent may follow which may itself be raised or lowered.

As far as pitch is concerned, we discussed two information structure-driven effects on pitch: F0-raising due to focus (19a) and F0-lowering due to givenness (19b). These effects are fully realized in the sentence-initial context. As a result, we saw a three-way contrast among FOF/SOF/Non-Focus: FOF being subject to F0-raising, SOF to both raising and lowering, and Non-Focus to lowering only.

In the sentence-medial context, phonologically-driven effects affect the realization as well. Downstep (20a) lowers the non-initial pitch accents. As a result, sentence-initial FOF is realized lower than sentence-initial one, although both bear the nuclear pitch accent. Postnuclear deaccenting (20b) prohibits pitch accentuation after a nuclear pitch accent. This effect obliterates the information structure-driven effects in the postnuclear context. Hence postnuclear SOF and Non-Focus do not show any significant difference.

5.3 Duration

Compared to the rather complex interactions of information structure-driven and phonologically-driven effects observed for pitch, duration shows relatively simple effects. We found two effects for duration, one focus-driven effect (19c), and one phonologically-driven effect (20c), repeated here.

(19c) Information structure-driven effect (duration)
focus triggers longer duration

(20c) Phonologically-driven effects (duration)
Phonological phrase final lengthening increases duration

The first effect amounts to an increased duration for focused items: a focused expression is longer than a non-focused one. As we saw in the results for

duration in section 4.2, there was no significant difference between FOF and SOF in terms of this lengthening effect. Contrary to what we observed for pitch, a difference in duration is observed only between focused material and non-focused material.

Moreover, we found a significant difference between sentence-initial and sentence-medial FOF and SOF. As we mentioned before, we propose that this difference is due to a purely phonological effect, namely phrase-final lengthening effect, stated in (20c). This effect correlates with phrasing: a phrase-final word is longer than a non-final one. Comparing the pitch contour of prenuclear SOF (Fig 1-iii) with that of postnuclear SOF (Fig 1-iv), it becomes evident that the expression *nur ihren Bruder* is phrased individually in the first case, where it is sentence-initial, but not in the second case, where it is sentence-medial. The same is true in the sentence-initial/medial FOF sentences in Fig 1-i and ii. Here, too, the early accent triggers an independent phonological phrase, but not the late one, which is again integrated into the phrase comprising the participle.

In (27) and (28), prosodic phrasing of our sentences for the subject and object sets is illustrated. The target constituents we study in this article are underlined. Consider first the sentences in (27) from the subject set. In (27a and b), the first NP, together with the preceding focus particle, forms its own phrase. The remainder of the sentence, namely the auxiliary, the second NP, and the participle form a second phrase. In both cases, *Peter* lengthens because it is phrase-final and because it is focused. *Peter* is also sentence-initial in the Non-Focus example (27d), but it is not lengthened, because it is neither phrase-final nor focused. As an explanation for the lack of independent phrasing of *Peter* in (27d), we offer the possibility that it is ‘dephrased’. The subject, being short and non-focused, is integrated into the following phrase. It is thus no longer phrase-final and undergoes no lengthening. In (27c) and (27e), *Peter* is phrase-medial,

and hence does not undergo lengthening because of phrase-finality. In (27c), however, *Peter* is lengthened because it is (secondarily) focused.

In the object set (28) *Bruder* is phrase-initial in (28b) and (28d), otherwise phrase-medial. When phrase-initial, it only lengthens when it forms its own phrase and is focused, as in (28b). In (28d), dephrasing because of non-focused status applies, and hence, there is no lengthening. When it is phrase-medial, the only reason to be lengthened is focus, which is the case in (28a) and (28c), but not in (28e).

(27) Phrasing in the subject set (*Peter*)

a. FOF: [Nur <u>Peter</u>$_{FOF}$]$_P$ [hat eine Krawatte getragen]$_P$

b. SOF: [Nur <u>Peter</u>$_{SOF}$]$_P$ [hat sogar einen Anzug$_{FOF}$ getragen]$_P$

c. SOF: [Sogar einen Anzug$_{FOF}$]$_P$ [hat nur <u>Peter</u>$_{SOF}$ getragen]$_P$

d. Non-F: [<u>Peter</u> hat Maria$_{FOF}$ geküsst]$_P$

e. Non-F: [Maria$_{FOF}$]$_P$ [hat <u>Peter</u> geküsst]$_P$

(28) Phrasing in the object set (*ihren Bruder*)

a. FOF: [Aber Eva]$_P$ [hat nur <u>ihren Bruder</u>$_{FOF}$ eingeladen]$_P$

b. SOF: [Nur <u>ihren Bruder</u>$_{SOF}$]$_P$ [hat Auch Eva$_{FOF}$ eingeladen]$_P$

c. SOF: [Auch Eva$_{FOF}$]$_P$ [hat nur <u>ihren Bruder</u>$_{SOF}$ eingeladen]$_P$

d. Non-F: [<u>Ihren Bruder</u> hat Eva$_{FOF}$ eingeladen]$_P$

e. Non-F: [Eva$_{FOF}$]$_P$ [hat <u>ihren Bruder</u> eingeladen]$_P$

In the Non-Focus sentences, there was no difference between sentence-initial and sentence-medial configurations. As in Figure 1-v, the prenuclear Non-

Focus is not phrased separately from the rest of the sentence, unlike the two focused contexts. Therefore final-lengthening effect does not apply in this case. As a result both prenuclear and postnuclear Non-Focuses are neither subject to focus-lengthening nor to phrase-final-lengthening. Thus they remain the shortest in duration and show no difference to each other.

In sum, duration is affected by both focus and phrasing. First, both FOF and SOF are typically longer than Non-F. Second, a focused constituent in a sentence-initial position tends to be phrased separately from the rest of the sentence, and is therefore subject to final-lengthening effect. As a result of these combined effects, sentence-initial focus is the longest, sentence-medial focus is only subject to focus-driven lengthening, hence becoming longer than Non-Focus. The latter is the shortest since it is affected by none of the factors influencing duration.

5.4 Implications

Our study shows the importance of taking into consideration the phonological and tonal system of a language in order to design experiments as well as to assess experimental results in pitch accents in relation to information structure. In view of the data obtained, we are able to claim that FOF is phonologically and phonetically more prominent than SOF which is in turn more prominent than Non-Focus. Though the effects of this hierarchy on the two correlates examined, pitch and duration, were not parallel, this is due to independent factors of the intonational system of German, namely postnuclear deaccenting, downstep, and phrasing.

Contrary to Rooth's and Beaver et al., we do not need to postulate two kinds of prominence (e.g., pitch accent for FOF, 'metrical accent'/'phrasal stress' for SOF) in a language like German or English. SOF expressions are realized by the phonetic means adequate for the positions in which they occur,

and these are different in pre- and in postnuclear locations. Prenuclearly, fine-grained differences between accents are realized by pitch. Postnuclearly, only duration (and possibly intensity) is available because of deaccenting. Experiments investigating only the postnuclear SOF realizations have no chance at arriving at this conclusion.

In view of the interest of SOF for the theory of focus, it is now possible to give a clear answer to the question whether SOF triggers phonological prominence. The answer is positive, and corroborates Beaver et al.'s findings: this prominence is less than a FOF accent, but more than a Non-Focus accent. It is only when independent phonological factors block pitch prominence that no accent can be realized, but this is independent of the intrinsic prominence of SOF, which is still realized with increased duration.

Returning briefly to the remarks on semantic theories based on the phonetic presence of accents in section 2, our results are compatible with both a strong and a weak version of focus theories. Recall that the weak version is dependent on physical correlates of focus because it assumes the focus to be grammaticalized, both syntactically and phonologically. The strong theory of focus, on the other hand predicts that focus can be dissociated from accent, since it is triggered by contextual considerations. However, common sense leads us to prefer a weak theory, since it is more constrained and relies on only one focusing device. As we have shown in this paper, the fact that phonetic correlates of accents might be completely absent from a focused word is still compatible with a weak theory, if deaccenting is motivated by phonological considerations. In other words, the absence of phonetic correlates of pitch in some configurations may be independent of the semantic interpretation of expressions, and due solely to phonological factors.

6 Conclusion

In this paper second occurrence focus was investigated for German. Until now, this phenomenon had been exclusively looked at from the point of view of its implications for theories of focus. Weak theories of focus, which require (pitch) accents on elements associated with a focus operator, have been thought to be jeopardized if SOF is realized without any prominence. Strong theories of focus, which propose that focus is modulated by contextual effects, cannot explain why SOF can be accented at all, since an accent is not necessary in order for the SOF to be correctly interpreted. We tackle the issue from a different angle and discuss the phenomenon from the point of view of phonology.

The results of our experiments in German, bearing on the phonetic correlates of first occurrence focus (FOF), second occurrence focus (SOF) and unfocused (Non-F) expressions, both in sentence-initial/prenuclear and sentence-medial/postnuclear contexts, indicate that it is crucial to keep issues of semantic theories and the phonological realization of accents apart. Prenuclear SOF are realized with pitch accents, albeit weaker than those accompanying FOF, but stronger than Non-Focus. In a postnuclear context, by contrast, no mark of pitch realization could be identified, though, as Rooth (1996), Bartels (2004) and Beaver et al. (2004) found for English, SOF had a longer duration than Non-Focus. We concluded that the absence of accent may be due to phonological factors only. This conclusion should have implications for the way phonological experiments bearing on other parts of grammar are designed.

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8 Appendix: Stimuli

(a) FOF

(1a) Die meisten unserer Kollegen waren beim Betriebsausflug lässig angezogen.
Nur Peter hat eine Krawatte getragen.

(2a) Die Fleissigsten haben bei der Theateraufführung etwas beigetragen.
Auch Melina hat beim Aufbau mitgeholfen.

(3a) Die Reisegesellschaft war von Italien ganz begeistert.
Sogar Monika hat Mailand geliebt.

(4a) Viele Frauen haben mehrere Verwandte zum Dorffest eingeladen.
Aber Eva hat nur ihren Bruder eingeladen.

(5a) Meine Brüder sammeln Autos, vor allem Mercedes und BMWs.
Ingo hat auch einen Jaguar gekauft.

(6a) Bei der Weihnachtsparty waren alle guter Laune.
Michael hat sogar ein Lied gesungen.

(b) SOF: Prenuclear

(1b) Die meisten unserer Kollegen waren beim Betriebsausflug lässig angezogen. Nur Peter hat eine Krawatte getragen.
Nur Peter hat sogar einen Anzug getragen.

(2b) Die Fleissigsten haben bei der Theateraufführung etwas beigetragen.
Auch Melina hat beim Aufbau mitgeholfen.
Auch Melina hat sogar beim Getränkenverkauf geholfen.

(3b) Die Reisegesellschaft war von Italien ganz begeistert. Sogar Monika hat Mailand geliebt.
Sogar Monika hat auch Venedig geliebt.

(4b) Viele Frauen haben mehrere Verwandte zum Dorffest eingeladen.
Aber Eva hat nur ihren Bruder eingeladen.
Nur ihren Bruder hat auch Maria eingeladen.

(5b) Meine Brüder sammeln Autos, vor allem Mercedes und BMWs. Ingo hat auch einen Jaguar gekauft.
Auch einen Jaguar hat sogar Markus gekauft.

(6b) Bei der Weihnachtsparty waren alle guter Laune. Michael hat sogar ein Lied gesungen.
Sogar ein Lied hat auch Waldemar gesungen

(c) SOF: Postnuclear

(1c) Die meisten unserer Kollegen waren beim Betriebsausflug lässig angezogen. Nur Peter hat eine Krawatte getragen.
Sogar einen Anzug hat nur Peter getragen.

(2c) Die Fleissigsten haben bei der Theateraufführung etwas beigetragen. Auch Melina hat beim Aufbau mitgeholfen.
Sogar beim Getränkenverkauf hat <u>auch Melina</u> geholfen.

(3c) Die Reisegesellschaft war von Italien ganz begeistert. Sogar Monika hat Mailand geliebt.
Auch Venedig hat <u>sogar Monika</u> geliebt.

(4c) [Viele Frauen haben mehrere Verwandte zum Dorffest eingeladen. Aber Eva hat nur ihren Bruder eingeladen.]
Auch Maria hat <u>nur ihren Bruder</u> eingeladen.

(5c) Meine Brüder sammeln Autos, vor allem Mercedes und BMWs. Ingo hat auch einen Jaguar gekauft.
Sogar Markus hat <u>auch einen Jaguar</u> gekauft.

(6c) Bei der Weihnachtsparty waren alle guter Laune. Michael hat sogar ein Lied gesungen.
Auch Waldemar hat <u>sogar ein Lied</u> gesungen.

(d) Non-Focus: Prenuclear

(1d) Wen hat Peter geküsst?
<u>Peter</u> hat Maria geküsst.

(2d) Was hat Melina gesehen?
<u>Melina</u> hat einen Unfall gesehen.

(3d) Wen hat Monika eingeladen?
<u>Monika</u> hat ihren Vater eingeladen.

(4d) Wer hat ihren Bruder eingeladen?
<u>Ihren Bruder</u> hat Eva eingeladen.

(5d) Wer hat einen Jaguar gekauft?
<u>Einen Jaguar</u> hat der Lehrer gekauft.

(6d) Wer hat ein Lied gesungen?
<u>Ein Lied</u> hat der Knabenchor gesungen.

(e) Non-Focus: Postnuclear

(1e) Wen hat Peter geküsst?
Maria hat Peter geküsst.

(2e) Was hat Melina gesehen?
Einen Unfall hat Melina gesehen.

(3e) Wen hat Monika eingeladen?
Ihren Vater hat Monika eingeladen.

(4e) Wer hat ihren Bruder eingeladen?
Eva hat ihren Bruder eingeladen.

(5e) Wer hat einen Jaguar gekauft?
Der Lehrer hat einen Jaguar gekauft.

(6e) Wer hat ein Lied gesungen?
Der Knabenchor hat ein Lied gesungen.

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