Subparts of contrastive topics and their relevance for the syntax–information structure interface

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This paper presents two experimentally confirmed observations about contrastive topics (CTs) in German: subparts of CTs can appear in the left periphery, and if a wide contrastive topic contains both a direct object and a directional PP, then only fronting of the DP is compatible with a wide VP contrast interpretation. These observations are reminiscent of the data presented by Fanselow & Lenertová (2011) about subparts of focus, who use them to argue against cartographic approaches that predict a one to one relation between fronted phrases and IS categories. My claim is that the CT data basically support this argument against cartographic approaches, but that it can not be subsumed under Fanselow & Lenertová's analysis for subpart of focus fronting, because their model predicts that movement of contrastively accented elements should be less restricted than it is in the data. A potential independent reason for this restriction is explored, suggesting that the unrestricted movement of subparts of CTs predicted by Fanselow & Lenertová can after all be observed under the right pragmatic circumstances.

1. Introduction

The main goal of this paper is to present new observations about subparts of contrastive topics in German and to make clear why and how they are relevant for a theoretical issue that is currently controversially discussed, namely the interface between syntax and information structure (IS).

As for the empirical part, I will focus on German dialogues like the following:

(1) Was hat Peter alles erledigt? 'What has Peter managed to do?'
Das /PÄCKCHEN hat er NICHT\ zur Post gebracht...
the parcel has he not to.the post.office taken...
'He has not taken the parcel to the post office...'

I will present experimental evidence that a dialogue like (1) can be felicitously continued in two different ways: either the fronted constituent with the rising accent 'das Päckchen' is contrasted, or the whole VP 'das Päckchen zur Post bringen'. The second option suggests that a subpart of

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a contrastive topic can appear in the left periphery of a German sentence. It will be shown that in this type of sentence, the 'wide contrast' reading is possible when the DP object is fronted, but not when the PP object is fronted.

Subparts of another IS category, namely focus, have been presented by Fanselow & Lenertová (2011, henceforth F & L) to argue that no IS features are directly encoded in syntax. This approach is directly opposed to the so-called cartographic approach, according to which movement to the left periphery is triggered by formal IS-related features. I will discuss the consequences of the new empirical data for both theories. On the one hand, I will support F & L's argumentation by adding more evidence that subparts of IS categories can appear in the left periphery, which is difficult to implement in cartographic models. On the other hand, I will show that the subpart of contrastive topic data does not follow as straightforwardly from F & L's model as the subpart of focus data. Based on certain assumptions about cyclic linearization and accentuation, F & L correctly predict that only the leftmost accented constituent of a wide focus can be fronted, but this explanation cannot be extended to contrastive topics. In F & L's model, movement of contrastively accented elements is predicted to be unrestricted; consequently, any subpart of a wide contrastive topic should be able to be fronted, which apparently contradicts the data mentioned above (only a fronted direct object is compatible with a wide contrast reading).

In sum, the experimental results imply that cartographic approaches undergenerate (for them, it is problematic that subparts of CT can be fronted at all), while F & L's model overgenerates (it does not capture that subpart of CT fronting is restricted). In principle, overgeneration is not necessarily a problem, if it can be shown that the observed restrictions are due to an independent reason. I will explore one such potential additional factor having to do with properties not of the fronted phrases, but the ones which stay in situ. The experimental items were recorded in such a way that everything except the two prominent accents on the contrastive topic and on the focus (indicated by '/' and '\' in (1)) were deaccented. I will present additional examples indicating that deaccentuation of the object that stays in situ is licensed in the DP-fronting case, but not in the PP-fronting case, which could independently account for the difference in acceptability. If this factor is controlled for, F & L's prediction that any subpart of a contrastive topic can be fronted is indeed borne out intuitively, although the experimental confirmation remains for future work.

The paper is structured as follows. In section 2, I introduce the relevant theoretical background concerning the syntax-information structure interface and contrastive topics. Then I present my observations about subparts of contrastive topics in section 3 and make clear why they are relevant for the discussion. In section 4, I present the results of a rating experiment that confirms my observations and discuss their consequences for the different theoretical approaches. In view of the conclusion that neither of them can account for the full range of data, possible solutions such as a hybrid model as suggested by Frey (2005), and an explanation based on the potential confounding factor mentioned above, are examined in 5. Section 6 summarizes the conclusions and points out open questions.

2. Theoretical Background

2.1. Syntax / information structure interface

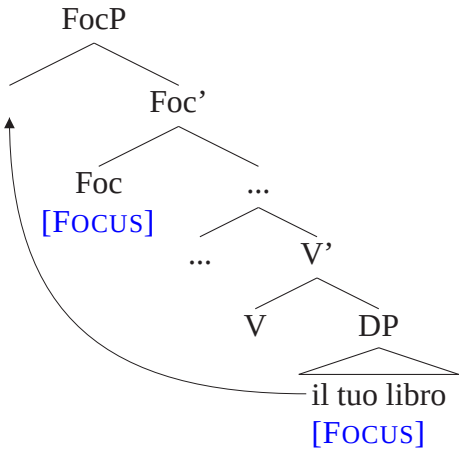
In many languages, movement to the left periphery seems to be correlated with information structural notions. For example, in Italian there are several different types of movement to the left periphery, and one of these movement types seems to affect phrases with a topic interpretation (involving an intonational break after the fronted constituent and a resumptive clitic) and another one focused constituents (without intonational break and clitic; examples from Rizzi (1997)):

(2) Clitic left dislocation (topic interpretation):
Il tuo libro, lo ho letto.
the your book, it I.have read
'As for your book, I read it.'

(3) Fronting without clitic (contrastive focus interpretation):
Il tuo libro ho letto.
the your book I.have read
'I read YOUR BOOK.'

Rizzi (1997) suggested to account for this by directly encoding IS features in syntax in terms of syntactic features. Based on word order data from Italian and other languages, Rizzi proposes a detailed analysis of the left periphery of a sentence, providing specific positions for specific IS categories. A constituent bearing a focus feature must move to a designated position in the left periphery, the specifier of a FocP, for feature checking reasons, and a constituent with a topic feature must analogously move to the specifier of a TopP. The following tree illustrates the idea, leaving aside functional projections that are not relevant here:

(4)



This general idea, referred to as the cartographic approach, was adopted for other languages. An example of a partly cartographic analysis of German, proposed by Frey (2005), will be discussed in detail at a later point.

A syntactic model that goes one step further and completely abandons cartographic assumptions has been proposed by Fanselow & Lenertová (2011). They argue that movement to the left

periphery is not directly related to information structure. Thus, no IS notions are directly encoded in syntax, an idea that has been labelled the 'Strong Modularity Hypothesis' by Horvath (2010) and that is directly opposed to the cartographic approach. According to F & L, movement to the left periphery is not triggered by a feature connected to IS, but by the Edge feature of C. This means that in principle any constituent can move to SpecCP.

There is, however, a certain restriction that has to do with linearization and accenting. F & L adopt the idea of cyclic linearization from Fox & Pesetsky (2005): When a spell-out domain (such as CP) is completed, all constituents in this domain have to be linearized by establishing ordering statements of the form $X > Y$. These statements cannot be changed or removed at a later point, and if a contradictory ordering statement is added, the derivation crashes. F & L complement this account by the assumption that structurally accented elements have to be linearized immediately when they are merged with respect to the structure that already exists at this point. Structural accents are those that are assigned to a sentence in an all-new-context by language-specific rules of prosodic prominence (this default pattern can be overwritten by more specific processes, such as the deaccentuation of given elements, or additional accents for contrasted material). The language-specific parameter which determines whether left or right branches are prosodically more prominent in the default case is one of the motivations for the close link between accents and linearization assumed by F & L; in this sense, linearization is a prerequisite of accentuation: it cannot be decided which branch gets the accent until it is clear which branch is the left or right one, so they have to be linearized immediately.

It follows from these considerations that syntactic movement of structurally accented elements must not cross structural accents. Since the linear order of an accented element relative to all lower elements is determined when it is merged, moving a structurally lower accented element above an accented element would result in a contradiction in the linearization statements

The main evidence for this comes from a phenomenon that F & L call 'Subpart of focus fronting' (SFF) and that they report for many languages, including German:

(5) Was hat Peter gefangen? 'What did Peter catch?'
[Einen Hasen]$_i$ hat Peter t_i gefangen.
a hare has Peter caught
'Peter has caught a hare.'

(6) Was hat Peter gemacht? 'What did Peter do?'
[Einen Hasen]$_i$ hat Peter t_i gefangen.
a hare has Peter caught
'Peter has caught a hare.'

(7) Was ist passiert? 'What happened?'
#[Einen Hasen]$_i$ hat Peter t_i gefangen.
a hare has Peter caught
'Peter has caught a hare.'

In (5), the fronted constituent corresponds exactly to the wh-word in the question, i.e. to the focus of the sentence. In (6), the fronted constituent corresponds to a *subpart* of the focus, which in this case is the whole VP. This is problematic for accounts based on information structural feature checking because they predict that the whole constituent bearing the relevant IS feature

should move; a subpart should not be able to check the feature. (7) shows that the predictions concerning accent crossing are borne out: in this all-new-context, 'Peter' is not mentioned in the question in contrast to the other two examples, and is therefore not given. Non-given elements (with some exceptions, e.g. functional categories) have to receive a structural accent in German, and that is why it is ungrammatical to move *einen Hasen* 'a hare' across *Peter* in this case. More generally, it follows from the model that only the leftmost structurally accented constituent of the focus can move to the left periphery. Under this view, the relation between syntax and IS is an indirect one: IS is related to prosody/accentuation, and accents are relevant in syntax.

In the remainder of this paper, I will add some new data about subparts of another IS category, namely contrastive topics, to this discussion and show that it is also problematic for analyses involving checking of IS features. I will argue that it does not follow from F & L's model, but that a confounding factor might be responsible for the mismatch between their predictions and the observed data.

2.2. Contrastive topics

I want to argue that there is an interesting difference between data involving subparts of contrastive topics as opposed to subparts of focus, so it is important to define what I mean by this term. My argumentation and my examples are based on the influential theory developed by Büring (1997, 2003). In this section, I will outline his main ideas.

Büring (2003) defines the IS categories focus and contrastive topic in prosodic terms: In English, contrastive topics are marked by a B-accent (fall-rise accent, i.e. a L*+H pitch accent followed by a L-H% boundary tone; cf. Jackendoff 1972) and foci by an A-accent (falling accent, H* followed by a L-L% boundary tone). For German, a similar accentuation pattern — rising accent for a CT, falling accent for a focus — is usually assumed (cf. Jacobs 1997). A specific property of German is that the rising accent always has to precede the falling accent and that the fundamental frequency F_0 stays at a high level between the two pitch accents, forming a pattern that has been labelled 'hat contour' or 'bridge contour'. Except for these two pitch accents, all the other material in the sentence is prosodically very reduced (for phonetic details, see Féry 1993, Mehlhorn 2001); this property will become important later in this paper. Abstracting away from the phonetic differences between English and German, in this paper I will indicate rising (CT) accents by '/' and falling (focus) accents by '\' for both languages. In example (8), 'Fred' is the CT and 'beans' is the focus.

(8) /FRED ate the BEANS\.

The goal of Büring's detailed analysis of the semantic–pragmatic properties of CTs is to be able to predict which CT-focus-sentences can occur in which contexts. The analysis is based on a certain extension of alternative semantics (cf. Rooth 1992) and on a hierarchic model of discourse.

Büring assigns three semantic values to a sentence containing a CT and a focus:

1. Ordinary value: semantic value in any formal, truthconditional, compositional frame-

work; e.g. following von Stechow (1991)):

[[/FRED ate the BEANS\]]^{O} = set of those worlds in which Fred ate the beans (this expresses a proposition)

2. Focus value: for a focused element, it is the set of contextually salient alternatives to it; the focus value of a sentence is a set of propositions, e.g.:

   [[the BEANS\]]^{F} = {[[the beans]]^{O}, [[the steak]]^{O}, [[the salad]]^{O}, ...}
   [[/FRED ate the BEANS\]]^{F} = {[[Fred ate the beans]]^{O}, [[Fred ate the steak]]^{O}, [[Fred ate the salad]]^{O}, ...}

3. CT value: a set of sets of propositions; calculated for a sentence by taking its focus value (a set of propositions) and replacing the CT-marked constituent in each member of the set, e.g.:

   [[/FRED ate the BEANS\]]^{CT} = { {[[Fred ate the beans]]^{O}, [[Fred ate the steak]]^{O}, [[Fred ate the salad]]^{O}, ...}, {[[John ate the beans]]^{O}, [[John ate the steak]]^{O}, [[John ate the salad]]^{O}, ...}, {[[Clara ate the beans]]^{O}, [[Clara ate the steak]]^{O}, [[Clara ate the salad]]^{O}, ...}, ... }

A standard idea concerning question semantics is that the semantic value of a question corresponds to the set of possible answers (Hamblin 1973). Under this view, the focus value of a sentence containing a focused constituent is identical to the meaning of a corresponding wh-question that asks about this constituent:

(9) [[FRED\ ate the beans]]^{F} = [[Who ate the beans?]]^{O} = $\{x$ ate the beans $\mid x \in D_e\}$

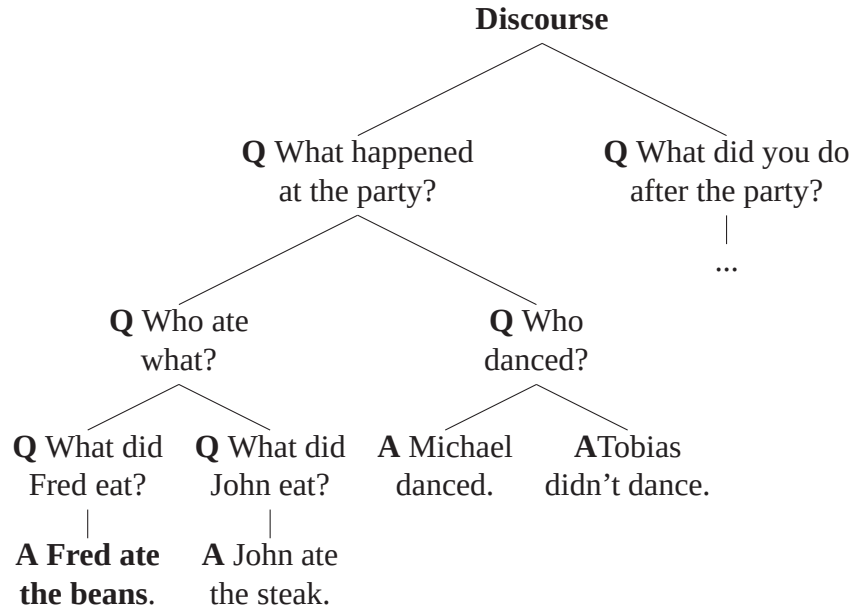
Büring shows that since a CT value is a set of focus values, it can also be regarded a set of questions, e.g.:

(10) [[/FRED ate the BEANS\]]^{CT} = {[[What did Fred eat?]]^{O}, [[What did John eat?]]^{0}, [[What did Clara eat?]]^{O}...} ={$\{x$ ate $y \mid y \in D_e\} \mid x \in D_e\}$

(11) [[FRED\ ate the /BEANS]]^{CT} = {[[Who ate the beans?]]^{O}, [[Who ate the steak?]]^{O}, [[Who ate the salad?]]^{0}...} ={$\{x$ ate $y \mid x \in D_e\} \mid y \in D_e\}$

The two examples show that the CT value depends on the position of the B-accent and A-accent: When the accents are swapped, the CT value corresponds to a different set of questions. Büring's key idea is to use this property to characterize the relation between sentences containing CTs and the contexts they occur in. For this purpose he adopts the discourse model of Roberts (1996), according to which a discourse is structured hierarchically by explicit and implicit questions. For example, a discourse in which (11) occurs could be structured like this:

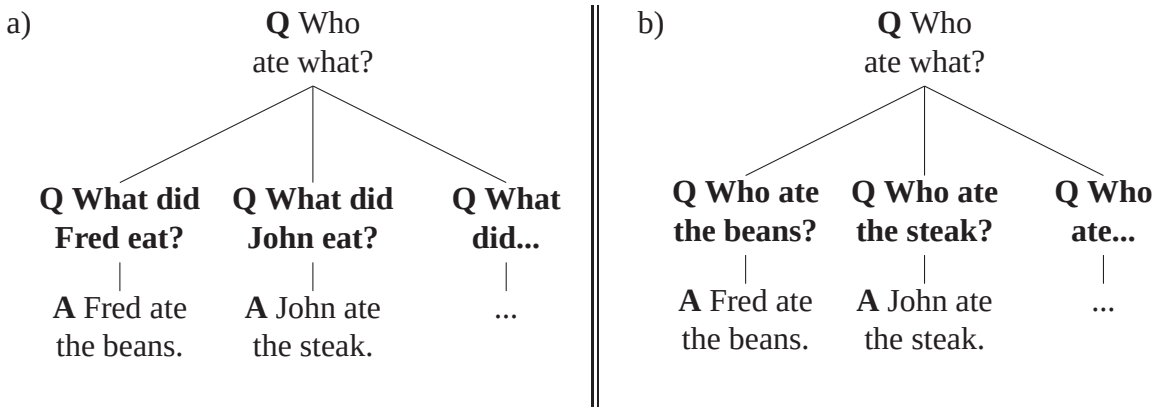
(12)



A sequence of utterances is felicitous if it satisfies certain 'Congruence principles', that is, if it can be mapped to a discourse tree in a specific way. The focus-marked constituent has to correspond to the wh-word in the question that is currently under discussion. The CT-marked constituent indicates what the *sisters* of the question under discussion have to be: they have to be members of the CT value.

Thus, taking into account the CT values given above, the sentence '/FRED ate the BEANS\' is compatible with the discourse structure given in (13a), and 'FRED\ ate the BEANS/' is compatible with (13b).

(13)



If a CT-focus-utterance is preceded or followed by utterances that cannot be mapped to the type of discourse tree that is indicated by the Focus and CT values, the sequence of utterances is predicted to be infelicitous:

(14) a. /FRED ate the BEANS\ (...but what did John eat? /...# but who ate the steak?).
b. FRED\ ate the /BEANS (...# but what did John eat? / ...but who ate the steak?).

In most of Büring's examples, the CT value is calculated based on a DP carrying a B-accent. The question I want to address in the following section is whether the CT value can also be based on bigger constituents containing the accented DP, e.g. on a VP.

3. Subparts of contrastive topics

3.1. Observations

In this section, I want to point out two properties of German CT-sentences that are relevant for theories of the syntax-IS interface:

1. Subparts of contrastive topics can appear in the German prefield.

2. In sentences with a direct object DP and a directional PP argument, it depends on which of these phrases is fronted whether the whole VP can be contrasted or not.

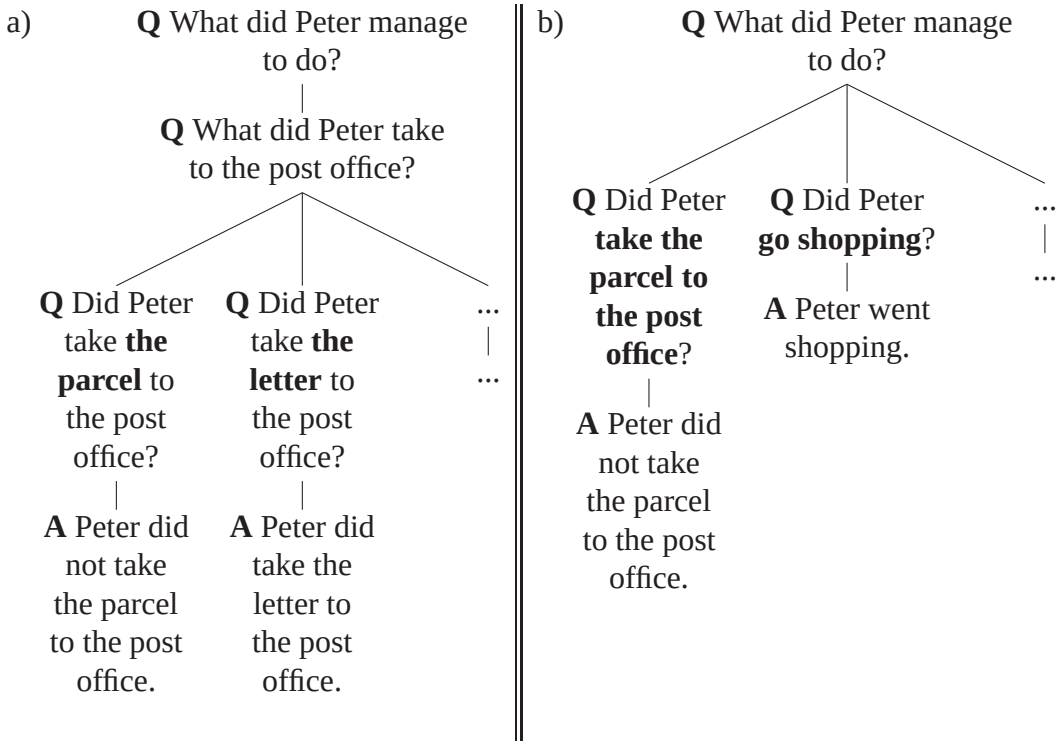
As I showed in section 2, if one follows Büring's (2003) view, the context indicates which category is the CT of a sentence. Let's look at example (1), repeated below as (15), in more detail.

(15) Was hat Peter alles erledigt? 'What has Peter managed to do?'
Das [/PÄCKCHEN]$_i$ hat er t_i NICHT\ zur Post gebracht...
the parcel has he not to.the post.office taken...
'He has not taken the parcel to the post office...'
a. ...aber wenigstens den Brief. '...but at least the letter.'
b. ...aber wenigstens hat er eingekauft. '...but at least he went shopping.'

The focus on *nicht* 'not' indicates that the implicit question under discussion is a yes-no-question like 'Did Peter take a parcel to the post office?'. The first type of continuation in (15a) suggests a discourse structure like (16a); the second type of continuation in (15b) suggests a discourse structure like (16b)[1].

[1]Note that in this case, the implicit superquestion 'What did Peter take to the post office?' contains only a single wh-word, in contrast to the standard examples in which the superquestion indicated by a contrastive topic usually is a multiple question containing two wh-words. That is a special property of contrastive topic utterances with verum/polarity focus.

(16)



As discussed in the last section, the CT value of a sentence results from substitution of the CT by alternatives to it and has to be congruent with the sisters of the current question. Therefore, the CT corresponds to the unit that varies in these questions (marked by boldface font in (16)). In (16a), this unit is the direct object DP; in (16b), it is the VP. Since the CT-sentence in (15) is compatible with both discourse strategies (both continuations are felicitous), I conclude that in this case, a subpart of a CT is in the prefield: the CT is 'das Päckchen zur Post bringen', but only a part of it, namely 'das Päckchen' appears in the prefield and carries a rising accent.

It has to be noted that this observation is not new and can be found several times as a side remark in the literature, e.g. in Jacobs (1997:96) and Büring (1997:72–73). Büring proposes that if it is a part of the CT that is fronted, it has to be the 'topic exponent' which is calculated like a focus exponent, i.e. it roughly corresponds to the most deeply embedded argument. In what follows I will argue that this generalization is not correct.

The second observation is illustrated by the contrast between (15) and (17):

(17) Was hat Peter alles erledigt? 'What has Peter managed to do?'
[Zur /POST]$_i$ hat er das Paket NICHT\ t_i gebracht...
to.the post.office has he the parcel not taken...
'He has not taken the parcel to the post office...'

a. ...aber wenigstens den Brief. 'But at least the letter.'
b. #...aber wenigstens hat er eingekauft. 'But at least he went shopping.'

The contrast clearly shows that whether VP-contrast is an available interpretation option depends on which part of the VP is fronted: if the direct object is fronted, both narrow DP contrast

and wide VP contrast are possible, whereas if the PP object is fronted, the sentence is infelicitous in a context indicating VP contrast. This shows that Büring's (1997) prediction is not borne out (under the assumption that the PP object is the most deeply embedded one). In the next section I want to motivate why the two observations are relevant for the syntax–IS interface discussion.

3.2. Relation to theories of the syntax–IS interface

As F & L point out, it is difficult to capture the fronting possibility of subparts of IS categories in cartographic approaches. Under the assumption that movement to the left periphery is triggered by feature-checking, it is expected that the whole category that bears this feature (or even a larger constituent in the case of pied piping) should move to the corresponding specifier position (for an extensive discussion, see Fanselow & Lenertová 2011:194–199). If my observations can be confirmed, they constitute additional evidence that this is not always the case.

In F & L's model, on the other hand, accents play an important role. Because of the close link between accentuation and linearization, structural accents must not be crossed. But what about other types of accents?

For F & L, a structural accent is one that is by default assigned to all elements that are not discourse-given or deaccented for other reasons (e.g. because they are functional elements). Contrastive topics are usually contextually given; consequently, they do not receive a structural accent. A contrastive accent can be assigned at any point during the derivation and it does not enforce immediate linearization. As a result, a phrase with such an accent has more freedom of movement — just like an unaccented element, it can both cross and be crossed by other elements, no matter whether they are structurally accented or not, since the order relative to the rest of the structure is not determined directly at merge.

It follows that this model makes different predictions about the behavior of subparts of (non-contrastive) foci and subparts of contrastive topics[2]. As we saw in (7), repeated as (18), in a wide TP-focus the accented subparts of the focus, i.e. the subparts of the TP, cannot cross each other, because they carry structural accents (for a study that confirms this experimentally, see Weskott et al. 2011).

(18) Was ist passiert? 'What happened?'
#[Einen Hasen]$_i$ hat Peter t_i gefangen.
a hare has Peter caught
'Peter has caught a hare.'

In contrast, no part of a contrastive topic in German receives a falling (structural accent). The prediction therefore is that CTs should be able to move to the left periphery without restrictions, i.e. any subpart of a contrastive topic should be able to appear in the left periphery. So it seems that movement of non-structural accents is too unrestricted in Fanselow & Lenertová's model to account directly for my observations. However, in section 5, I will argue that the independent

[2]The status of contrastive foci in F & L's system is not fully specified; I will assume here that all contrastive elements including contrastive foci only have a contrastive accent and no structural accent.

felicity condition 'Don't deaccent non-given elements' has to be taken into account, too, and that it is possible that the difference in acceptability can be attributed to this confounding factor.

But first, I want to present the results of a rating experiment in order to make sure that my intuitions are shared by other speakers of German. Acceptability judgments about sentences containing contrastive topics are especially difficult to compare because the accentuation pattern has to be taken into account, and sometimes contradictory judgments about the same sentence can be found in the literature if the accentuation is not indicated clearly. So an experimental study which controls for this factor can help to establish a more objective dataset.

3.3. Hypothesis

It is problematic to formulate the first part of my observations (subparts of CTs can appear in the German prefield) as an experimental hypothesis, because it would mean predicting the absence of an effect: a sentence with a fronted subpart of a CT should be equally acceptable in a context indicating wide contrast as in a context indicating narrow contrast.

But taken together with the second observation, the formulation of a positive prediction is possible in the following way:

- Hypothesis H_1: When we ask native speakers of German to rate CT-focus-sentences with a direct object and a directional PP in two different contexts and with two different word orders, then there is an *interaction* between the two factors (type of contrast, determined by context — 'narrow' or 'wide' —, and word order — fronted PP or fronted DP).

- The null hypothesis H_0 states the opposite: There is no such interaction.

I will also test whether the interaction goes in the predicted direction: sentences with a fronted PP in a wide contrast context should be rated worse than sentences with a fronted DP in a wide contrast context; both sentences should be fine in a narrow contrast context.

4. Experiment

4.1. Participants

25 students (mainly of linguistics or psychology) participated in the experiment to fulfill curricular requirements. I excluded the results of two participants because they were not native speakers of German, and of one participant because of technical problems during the experimental trial.

4.2. Method and design

The participants' task was to rate the acceptability of short dialogues consisting of a question and an answer. They were asked to judge on a scale (1–7) how well-formed the answer was and how well it fitted the question. The experimental items and fillers were recorded in advance and

presented auditorily using headphones in randomized order. The stimuli were read by two female students following my instructions concerning the intonation. The total of 64 experimental items was distributed using a latin-square design such that each participant heard 16 experimental items (each item only in one of the conditions), and additionally all participants heard the same 32 fillers. After each audio file, the participants had 3 seconds to give their rating on a questionnaire. Before the trial they were shown 3 examples illustrating the task and 5 training items after which they had the opportunity to ask questions.

The experimental design was 2×2 with the two factors 'fronted XP' and 'type of contrast' and the dependent variable 'acceptability rating'.

- Factor 1: Fronted XP

  Level 1: Fronted DP

  Level 2: Fronted PP

- Factor 2: Type of contrast (determined by context)

  Level 1: DP/PP contrast ('narrow contrast')

  Level 2: VP contrast ('wide contrast')

4.3. Stimuli

I constructed 16 token sets, resulting in a total of 64 experimental items. All items were constructed as a short dialogue between two people. The target sentence in each of them included a three-place predicate with a definite direct object and a prepositional argument, e.g. *das Päckchen zur Post bringen* 'to take the parcel to the post office', *die Filme ins Regal stellen* 'to put the movies onto the shelf', etc. In all items there was a prominent rising accent on the fronted phrase and a falling accent on the negation; in between, the fundamental frequency F_0 stayed at a high level. The presence of the hat contour was controlled both perceptually and by checking the visual representation of F_0 using the software Praat.

The factor 'type of contrast' was manipulated by changing the context. To make sure that the context forces the interpretation that the whole VP is contrasted, in this condition speaker A states that someone had several tasks and asks which ones he or she managed to complete. Speaker B utters the target sentence (stating that one of the tasks was not completed), followed by a second sentence (stating that at least some other task was completed) which ensures that it cannot be the fronted PP/DP alone that is contrasted. This is achieved by using an intransitive verb (*einkaufen* 'go shopping', *aufräumen* 'tidy up', *abwaschen* 'wash the dishes', *fegen* 'sweep the floor') in the second clause. If a transitive verb with an object was used instead, it could still be argued that it's only the fronted element that is contrasted; e.g. in a context like 'The parcel, he did not take to the post office, but at least he tidied up his room' it would be possible that 'the parcel' itself is contrasted with 'the room' — 'As for the parcel, the corresponding task was not completed, but as for the room, it was'. This is not possible with the intransitive verbs that were used.

In the ‘narrow contrast’ condition, speaker A asks about the object or the directional PP of a three-place predicate, e.g. in the fronted DP condition, the question is which things Peter took to the post office, making alternative objects salient. In his response, speaker B states that he knows about one object that Peter did *not* take it to the post office, but he does not know what he *did* take there. Thus, he is answering implicit subquestions like ‘Did Peter take X to the post office?’, ‘Did Peter take Y to the post office?’, ..., which ensures that in this context it is the parcel alone that is contrasted with alternative objects (analogously for the ‘fronted PP’ condition, where the PP is contrasted with alternative places). Instead of overtly naming one alternative as in the ‘wide contrast’ condition (e.g. *das Päckchen zur Post bringen* ‘take the parcel to the post office’ vs. *einkaufen* ‘go shopping’), I chose a less explicit continuation in the ‘narrow contrast’ condition. The reason is that it would have been easy to find alternative objects that Peter could have taken to the post office, but for most items it would have been very difficult to find alternative, plausible places where Peter could have taken the parcel, put the vase, thrown the trash, etc., if not to the post office, on the table and into the trash can, respectively. More importantly, in combination with the definiteness of the DP, a continuation of this type would be semantically odd (‘He did not take the parcel to the post office, but at least he took it somewhere else’ does not make much sense in most situations). For this reason, the continuation in this condition is a vague ‘...but I cannot tell you more about this’, and the narrow contrast is established only by the question.

The following token set exemplifies the general form of the items:

1.1 Weißt du, was Susi alles zur Post gebracht hat?
‘Do you know what Susi took to the post office?’
Das /PÄCKchen hat sie NICHT\ zur Post gebracht, aber mehr weiß ich
the parcel has she not to.the post.office taken but more know I
darüber auch nicht.
about.that also not
‘The parcel she did not take to the post office, but I don’t know more about that either.’

1.2 Susi hatte doch einige Aufgaben; weißt du, welche sie erledigt hat?
‘Susi had several tasks; do you know which of them she managed to do?’
Das /PÄCKchen hat sie NICHT\ zur Post gebracht, aber wenigstens hat sie
the parcel has she not to.the post.office taken but at.least has she
eingekauft.
shopped
‘The parcel she did not take to the post office, but at least she went shopping.’

2.1 Weißt du, wohin Susi das Päckchen gebracht hat?
‘Do you know where Susi took the parcel?’
Zur /POST hat sie das Päckchen NICHT\ gebracht, aber mehr weiß ich
to.the post.office has she the parcel not taken but more know I
darüber auch nicht.
about.that also not
‘To the post office she did not take the parcel, but I don’t know more about that either.’

2.2 Susi hatte doch einige Aufgaben; weißt du, welche sie erledigt hat?

‘Susi had several tasks; do you know which of them she managed to do?’
Zur /POST hat sie das Päckchen NICHT\ gebracht, aber wenigstens hat sie
to.the post.office has she the parcel not taken but at.least has she
eingekauft.
shopped
‘To the post office she did not take the parcel, but at least she went shopping.’

Among the 32 fillers, 24 contained a corrective or new information focus that matched the wh-question in 50% of the dialogues. 8 fillers were used as a small explorative study of contrastive topic construction similar to the experimental items, but with verum focus on the finite/infinite verb instead of focus on the negation.

4.4. Results

The means and standard deviations are given in Table 1 and visualized as an interaction plot in Figure 1.

	fronted DP	*fronted PP*
narrow contrast	4.94 (1.53)	5.18 (1.51)
wide contrast	4.47 (1.57)	3.16 (1.65)

Table 1: Means and standard deviations

Tables 2 and 3 show the results of the inferential statistical tests that were carried out, namely two ANOVAs (analyses of variance). The tables show that both factors had a significant effect on the dependent variable, the rating, and that the interaction between the two factors was significant, too.

Effect	F	p	p$<.05$
type of contrast	15.22742	0.0008205	*
fronted XP	21.06676	0.0001587	*
interaction	51.73362	0.0000004	*

Table 2: ANOVA by subjects

Effect	F	p	p$<.05$
type of contrast	110.10490	0.00000003	*
fronted XP	23.47271	0.0002142	*
interaction	21.85762	0.0002990	*

Table 3: ANOVA by items

A paired t-test showed that there is a significant difference between the means of the “fronted PP, narrow contrast” condition and the “fronted PP, wide contrast” condition ($p < 0.05$), whereas the means of the two “fronted DP” conditions do not differ significantly ($p > 0.1$).

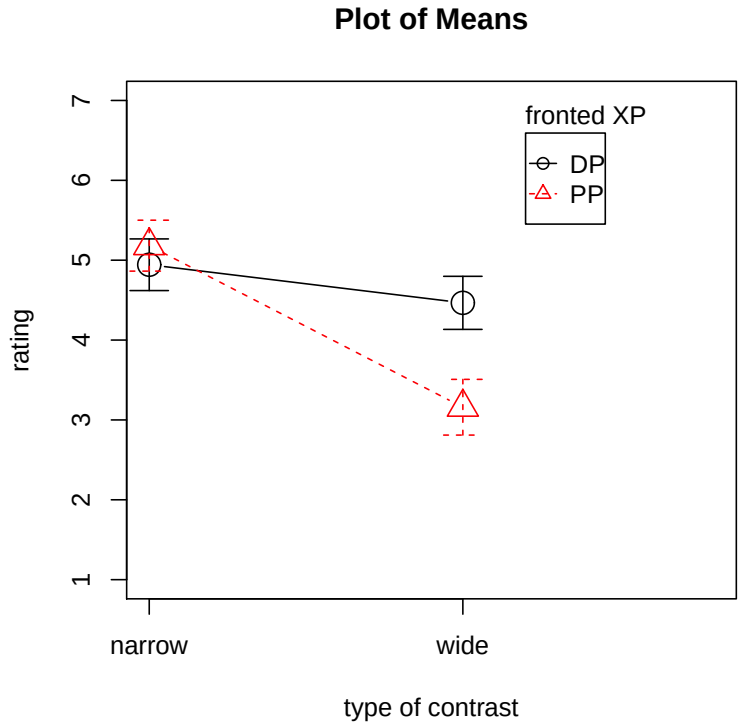


Figure 1: Visualization of the means (bars = 0.95 confidence intervals)

4.5. Discussion

The null hypothesis that the two factors 'fronted XP' and 'type of contrast' do not interact is to be rejected: a highly significant interaction between the two factors was found. Additionally, the results show that the interaction is of the predicted kind — sentences with a fronted DP are compatible with both types of contrast, narrow DP contrast and wide VP contrast, whereas sentences with a fronted PP were rated significantly lower in the 'wide contrast' condition[3]. I take these results as a confirmation of my two observations: subparts of contrastive topics can appear in the German prefield, and whether the wide contrast interpretation is possible depends on which subpart has been fronted.

One of the theoretical consequences of these findings is that it is problematic to adopt a purely cartographic approach to the left periphery for the German prefield. If we assume that it

[3]Somewhat surprisingly, the experimental items did not get optimal ratings in any of the conditions; even in the theoretically uncontroversial 'narrow contrast' condition, they only got ratings around 5 (on a 7-point scale). In comparison, the mean rating of those fillers in which the focus of the answer matched the wh-word of the question was 6.34. The lower acceptability of sentences containing contrastive topics could be attributed to their higher prosodic and pragmatic markedness as compared to sentences with only one focused and accented element. Another potential explanation is that the responses within the experimental items could have been perceived as less 'helpful', because they gave a partial and less straightforward answer to the question than in the filler dialogues. Since the participants were asked to judge how well the answer fitted the question, this factor could also be responsible for the overall lower ratings.

is an information structure related functional projection like FocP, TopP or ContrastP that the phrase moves to, and that this movement is triggered by a corresponding feature, such a model would undergenerate: sentences in which only a part of a contrastive topic is fronted could not be derived.

As for F & L's model, it has been pointed out in the previous section that movement to the prefield is too unrestricted with respect to elements with contrastive accents. Contrastive topics are usually contextually given and thus do not receive a structural accent. Assigning a non-structural, contrastive accent does not force immediate linearization, so these elements can change their position relative to other elements during the derivation, i.e. they can cross and be crossed by other constituents. It follows that in contrast to subparts of focus, where only the leftmost accented element can be fronted, there should be no such limitation for subparts of contrastive topics. Yet, we find a similar restriction in the data.

To sum up, the observations about subparts of focus and subparts of contrastive topics in German are two data sets that look very similar: in both cases, it seems to be the case that only the leftmost subpart can be fronted. One of the data sets, namely that subpart of focus data, directly follows from F & L's assumptions about the relation between structural accentuation and linearization, and it is tempting to extend this analysis to the second data set. But it has been shown that due to the different status of structural and contrastive accents, the contrastive topic data do not follow from the model.

It is important to note that this does not mean that the data is incompatible with F & L's account. If the reasoning outlined so far is correct, their syntactic model overgenerates with respect to subpart of contrastive topic fronting, but the low acceptability of one of the conditions could in principle be due to independent, non-syntactic reasons

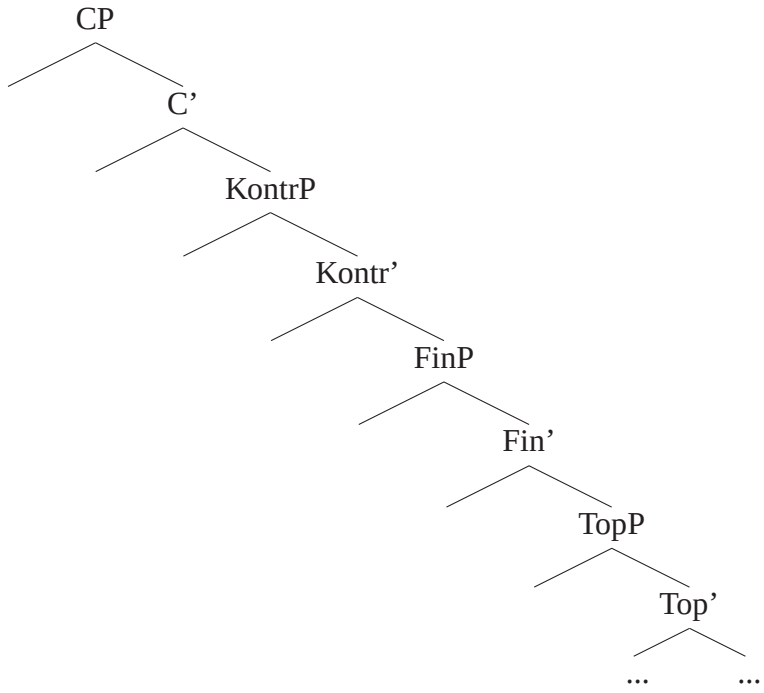
5. Further questions

So far, it has been shown that the experimental results suggest that a cartographic approach to the German prefield undergenerates, and F & L's approach overgenerates. In this section, I will discuss possible solutions for this problem and put some of their additional predictions to a preliminary test using intuitive judgments.

5.1. A hybrid model

Since a purely cartographic approach predicts too strong restrictions on syntactic fronting in German and the restrictions in F & L's model are not strong enough, a combination of the two comes to mind as a potential solution. The approach proposed by Frey (2005) can be seen as an instance of such a hybrid model. Frey assumes that there are different types movement operations that can target the German left periphery, and one of them resembles fronting within the cartographic approach in that the operation is triggered by an IS-related feature (contrast), and another one is triggered by an unspecific EPP feature, completely independent of the IS status of the fronted element, similar to the movement triggered by the Edge feature in C in F & L's approach.

To see the consequences for the model by Frey (2005), a closer look at the syntactic structure that he assumes is necessary. He proposes that the left periphery of German sentences involves the following functional projections:



In a German declarative main clause, the finite verb usually appears in the second position (V2 clause), preceded by exactly one costituent in the prefield position. The part of the structure between the finite verb and the infinite verb (if present) is referred to as the 'Mittelfeld'. According to Frey, the verb of a V2 clause appears in C, Kontr or Fin, as the head of the phrase with the highest overtly realised specifier. Aboutness topics have to move (at least) to the SpecTopP position in the Mittelfeld (which is immediately above the base position of sentential adverbials). Foci have the option of staying in situ.

There are three options for a constituent to get into the prefield position: 1. It is one of the elements that can be base generated in SpecCP, e.g. a discourse-related adverbial. 2. It has an interpretable Kontrast feature (a contrastive interpretation) and moves to SpecKontrP for feature checking reasons. 3. It is the highest element in the Mittelfeld and moves to SpecFinP because of its EPP feature. This operation is called Formal Fronting and it does not require any specific IS interpretation of the affected element.

The first option is not relevant here. As for the second option, as already briefly discussed, the prediction is that the *whole* constituent carrying a contrastive feature should move, because uninterpretable features cannot be checked by parts of constituents with the corresponding interpretable feature. In contrast, if we assume that it is the third option that happens, the predictions fit the experimental data. In the items, the fronted elements were not the highest element after the finite verb; in all items, there was a subject pronoun *er* 'he' or *sie* 'she' directly following the verb. But in Frey's system, weak pronouns in this position do not strictly speaking count as belonging to the Mittelfeld; they can be cliticized to C, so they do not block Formal Fronting of lower elements. This means that in the condition with a fronted DP, this DP could have moved

to the prefield by Formal Fronting. Since this operation does not require the fronted element to have any specific IS interpretation, a sentence of this type could in principle appear in all contexts. In the condition with a fronted PP, the Formal Fronting analysis is not available; thus, within Frey's system, the PP must have an interpretable contrast feature; this means that the PP itself is contrasted, it cannot be only a part of what is contrasted. This correctly predicts that this type of sentence is only compatible with a 'narrow contrast' context, but not with a 'wide contrast' context.

The discussion has shown that it is necessary to assume a syntactic movement operation for German that is not directly linked to information structure to account for the fact the subparts of IS categories can appear in the prefield. The experimental data shows that also subparts of contrastive topics can appear in this position, supporting the argument against purely cartographic approaches. So far, I have argued that the minimality restriction of Frey's Formal Fronting operation (the EPP feature in Fin can only attract the closest element, i.e. the highest element in the Mittelfeld) correctly captures the difference between the 'fronted DP' and 'fronted PP' conditions. The accent crossing restriction in F & L model does not apply to contrastive accents; their movement to the left periphery is syntactically non-restricted. It follows that the acceptability difference found in the experiment cannot have a syntactic reason, but would have to be caused by an independent factor. In this section, I would like to take into account some intuitive acceptability judgments of related examples to get a first idea whether Frey's account can be extended to more data, and whether there is an independent factor that causes the difference between the 'fronted DP' and 'fronted PP' condition.

I will look at further predictions of Frey's model first. Some modifications of the experimental items could serve as a test case for them. One of the predictions is that the 'fronted DP' condition should become unacceptable when the definite DP is replaced by an indefinite one and the adverb *nie* 'never' is used instead of *nicht* 'not'; in this case, the indefinite DP cannot be the highest element of the Mittelfeld because it cannot scramble above the adverbial, as (19) shows; therefore, following Frey (2005), *das Päckchen* 'the parcel' in (20) must be in SpecKontrP, which means that it has a contrastive feature and should not be felicitous in wide contrast contexts.

(19) a. Ich glaube, dass er noch nie ein Päckchen zur Post gebracht hat.
I think that he never.before a parcel to.the post.office taken has
'I think that he has never taken a parcel to the post office before.'
b. *Ich glaube, dass er [ein Päckchen]$_i$ noch nie t_i zur Post gebracht hat.

(20) Ein /PÄCKCHEN hat er noch NIE zur Post gebracht...
a parcel has he before never to.the post.office taken

Another prediction is that in the 'fronted PP' condition, the only available interpretation should be that the PP alone is contrasted. The sentence should be infelicitous in a context that indicates that the V' node (zur Post bringen 'take to the post office') is contrasted, as in (21).

(21) Zur /POST hat er das Päckchen NICHT gebracht, aber wenigstens hat er es
to.the post.office has he the parcel not taken but at.least has he it

verpackt.
packed
'He did not take the parcel to the post office, but at least he wrapped it.'

Intuitively, the predictions are not borne out. Just as its counterpart with the definite DP, (20) seems to me to be perfectly compatible with both a narrow and a wide contrast interpretation. (21) is also perfectly felicitous for me, indicating that even in the 'fronted PP' condition a bigger unit than the PP can be contrasted. However, these variants have not been tested in my experiment.

5.2. Other non-cartographic approaches

5.3. A potential confound

As for F & L, their prediction is that there should be an additional factor that explains the contrast found in the experiment. A first hint for the existence of a confounding factor comes from (22), which shows the experimental items in an all-new-context:

(22) Was gibt's Neues? 'What's new?'
PETER hat das PÄCKCHEN zur Post/zur POST gebracht.
Peter has the parcel to.the post.office taken.
'Peter has taken the parcel to the post office.

Usually, in an all-new-context all arguments receive a pitch accent in German; the verb can either be accented or unaccented depending on the phrasal integration of the verb and its immediately preceding argument, an optional process (see Féry & Kügler 2008). In a structure with a direct object and a directional PP, it seems that both arguments can be integrated optionally, so that only one argument has to receive a pitch accent, and the other argument and the verb can be unaccented. This has been noted in the literature: Jacobs (1991) observes that the integration process seems to 'ignore' the directional argument; Rosengren (1989) proposed to explain this fact by considering the directional argument and the verb together as V^0. Whatever the correct explanation for this accentuation pattern is, it is important that the option of being unaccented only holds for the directional PP, but not for the direct object.

The following line of thought explores the question whether this difference could have had an influence on the experimental results, and it is based on an argument by Büring (2006) against the standard view on focus projection. Büring points out an important confounding factor that had been often overlooked in discussions about examples with wide focus. The standard view on focus projection (as found e.g. in Selkirk 1995) states that the part of a sentence that answers a wh-question has to be 'F-marked'. 'F-marking' is a feature of accented terminal nodes, and in certain syntactic configurations, it can project so that bigger constituents get F-marked. For example, in the standard example (23a), the direct object 'desk' is accented and thus F-marked, and from this position the F-marking can project to the VP and TP level. Consequently, (23a) can be felicitously uttered in contexts like 'What is your neighbour building?' (narrow DP focus), 'What is your neighbor doing?' (VP focus) and 'What's that noise?' (IP focus). In

contrast, (23b) is incompatible with an IP question. Under the theory of focus projection, this is so because the F-marking of an accented element in subject position cannot project to the IP level.

(23) a. My neighbor is building a DESK.
b. My NEIGHBOR is building a desk.

Büring (2006) argues that these examples merely show that this generalization is true in *all-new-contexts*. However, rules of focus projection are not necessary to account for this. There is an independent factor that confounds the findings, namely the requirement that only given constituents may be deaccented in English. This becomes clear when one looks at examples in which parts of the relevant sentence have been previously mentioned in the discourse, as in (24); here, only the subject is accented, but nevertheless the utterance is felicitous as a reply to an IP question:

(24) Why did Helen buy bananas?
Because JOHN bought bananas.

Büring shows that under the right circumstances, also accents in other syntactic positions that are supposed to be unable to project under the focus projection theory can license wide focus, e.g. adverbs and indirect objects. So the impression that we get from (23), that objects differ fundamentally in their ability to license a wide focus interpretation, is due to a confounding factor. (23b) is simply infelicitous in an all-new-context because 'a desk' is deaccented, but not given. (23a) is felicitous in such a context, at least if both 'my neighbor' and 'a desk' are accented (the first accent is often neglected in focus projection approaches because only nuclear stress, i.e. the last pitch accent is considered to be relevant).

Simplifying a bit, Büring (2006) assumes that the basic prosody-IS mapping rule is that the focused part of a sentence has to contain a pitch accent. By assumption, it is determined by question-answer congruence what the focused part of a sentence is. The rest of the prosodic realization is determined by rules of default prominence and additionally by the condition that given elements can (but need not) be deaccented.

I think that this reasoning can be applied to my data in a rather straightforward way. I assume that there is a similarly loose condition on prosody-IS mapping: a contrastive topic (which part of the sentence is the contrastive topic is also determined by context, in the way described in section 2) has to contain a rising accent. When I reconsider my experiment design, it is clear that in the VP-contrasting contexts, only the subject was given ('What did Peter manage to do?'), therefore deaccenting of any other constituent, in particular of the direct object and the PP argument, is not licensed by givenness. Yet, the experimental items were recorded in such a way that everything except for the prominent rising and falling accent was prosodically very reduced. So far, the prediction would be that both word order variants should be bad in this context. However, we saw above that the deaccentuation of the directional PP is licensed even in an all-new-context. This property holds for most items that were used in the experiment. Thus, the factor 'Is the deaccentuation of the in situ argument licensed?' directly correlates with the word order factor and could in principle be responsible for the difference in acceptability.

The crucial prediction now is that the fronted PP variant should get considerably more acceptable in a context where deaccenting of the direct object is also licensed. This can be tested by putting it in a context where *das Päckchen* 'the parcel' has been previously mentioned, without changing the question under discussion:

(25) Hatte Peter nicht einige Aufgaben? Warum steht das Päckchen immer noch hier?
'Didn't Peter have some tasks? Why is the parcel still here?'
Stimmt, zur /POST hat er das Päckchen immer noch NICHT gebracht, aber
right to.the post.office has he the parcel still not taken but
wenigstens war er einkaufen.
at.least was he shopping
'You're right, he still hasn't taken the parcel to the post office, but at least he went shopping.'

Intuitively, in this context the sentence is indeed much more acceptable. Note that it is still the whole VP that is the contrastive topic according to the principle of CT congruence. The question 'Didn't Peter have some tasks?' and the continuation '...at least he went shopping' are only compatible with a discourse structure in which the VP is contrasted[4].

Moreover, there should be a different possibility to make a 'fronted PP' sentence acceptable in a wide contrast context if this idea is correct[5]: if 'das Päckchen' is not deaccented, then the prosody-IS mapping rule is not violated either.

(26) Hatte Peter nicht einige Aufgaben? Was hat er schon alles erledigt?
'Didn't Peter have some tasks? What did he manage to do?'
Zur /POST hat er das /PÄCKCHEN NICHT gebracht, aber wenigstens war er
to.the post.office ha she the parcel not taken but at.least was he
einkaufen.
shopping.
'He hasn't taken the parcel to the post office, but at least he went shopping.'

Again, intuitively, the sentence gets much more acceptable.[6]

Whether these examples can really be fully acceptable under the right circumstances (provided that everything that is deaccented is really licensed to be deaccented) remains to be tested in a study that carefully controls for this factor.

[4]CT congruence is more difficult to control for than question-focus congruence, because it makes reference to implicit subquestions. It is not trivial to exclude the possibility that in an example like (25) there really is no implicit question like 'What did he do with the parcel?' or 'Where did he take the parcel?', which would mean that the contrastive topic is a smaller unit than the VP. I assume that a sequence of utterances is mapped to the smallest possible discourse tree, which in (25) is one with the (partly implicit) discourse structuring questions 'What did Peter do?', 'Did he take the parcel to the post office?' / 'Did he go shopping?' / ...

[5]I thank Radek Šimík for pointing this prediction out to me.

[6]An interesting observation about (26) is that the pitch accent on *das Päckchen* 'the parcel' is realized as a rising accent, although it does not indicate contrast but is an instance of what F & L would call a structural accent. The specific realization probably has to do with the fact that it occurs at a point of the utterance where F_0 is at a high level (in the middle of the hat contour).

6. Summary and Outlook

In this paper, I have tried to add a new aspect to the discussion about the nature of the syntax-information structure interface, namely data about behavior of subparts of contrastive topics. I have shown that they can appear in the German prefield and that they are apparently subject to the same movement restrictions as subparts of focus (only the leftmost subpart can be moved). Yet, I have argued that a careful separate investigation of the two data sets is needed because the new data cannot be subsumed under existing analyses of movement of subparts of IS categories. In particular, it has been shown that that the model proposed by Fanselow & Lenertová (2011), which accounts for observations about subparts of focus, does not predict the same behavior for contrastive topics; fronting of their subparts should not be syntactically restricted. However, it has to be noted that a confounding factor could be at play in the experimental results: the differences in acceptability could also be due to conditions on deaccenting. How big the influence of this factor is is an interesting question that remains to be explored in future studies.

As for the competing cartographic approach, the data supports F & L's argument against linking movement to the left periphery directly to IS features, in this case contrast. I have argued that it is necessary to include the option of a movement operation independent from IS into a syntactic model of German, such as the Formal Fronting operation in the system of Frey (2005). Whether his implementation, that includes a syntactic minimality condition, or F & L's account, which makes predictions with respect to accent crossing, is preferable, cannot be decided on the basis of the study presented in this paper, but remains for further empirical research.

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