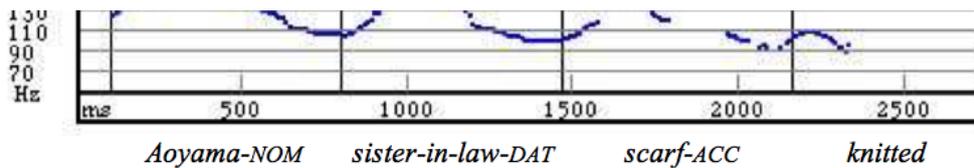


Notes to the typesetter:

I aligned the German examples and their glosses with tabs. Sometimes I used the preset tabs for this, sometimes I inserted the positions of the tabs manually. There is no meaning to this difference. Also, if in some examples, some of the spaces are larger than in others, there is no meaning to this either. Ideally, the spaces done with tabs would be reasonably small in the typeset version in both cases.

The figures each consist of a picture-file, below it a line of text with words that are aligned to the picture-file, and below that the figure caption. In the current document, the alignment of the picture-files to the text below them can be seen: normally, there is one complex word of text between two vertical lines of the picture. Ideally, this complex word should be centered between these vertical lines of the picture:



The quality of the picture-files in this text is not very high, however. I provide better-quality (otherwise identical) picture files separately, which I send to the editor, Gorka Elordieta. These do not include the words below them. If possible, please use these better-quality picture-files, and take the information which word belongs between which vertical lines from the document below.

The separate better-quality picture files are made with Adobe Photoshop. I can save them in different formats if that is helpful or make other changes to them.

If I can help with this in any way, please do not hesitate to contact me:
<hubert.truckenbrodt@gmail.com>.

Thank you for your help.

On the prosody of German *wh*-questions*

Hubert Truckenbrodt

1. Introduction and background

1.1. Introduction

This paper explores the prosody of German *wh*-questions, concentrating on single- and multiple-*wh* questions. Its body consists of two halves, sections 2 and 3, with connected but separate goals.

In section 2, I wish to contribute ground-work to the young field of *wh*-prosody. Building on Jacobs (1991) for German and Hamlaoui (2011) for French, the method of studying questions in controlled contexts is expanded and developed. A range of initial results of this method are shown that may be more generally useful for the study of *wh*-prosody across languages. These include confirmation of existing observations, which are put on a more solid empirical and theoretical footing in this discussion, as well as a number of new observations.

In section 3, an analysis of the default stress of German *wh*-words (a result of section 2) is developed. It connects the observations in German to the prosody of *wh*-words in Japanese and other languages. The account adopts the perspective that all *wh*-words carry an inherent F-Feature and develops the prosody of F in this perspective. A central element of the account is that movement to Spec,FocP is an alternative to focus prosody.

The results of the paper are summed up in a final section 4.

In the remainder of the current section 1, background assumptions about prosody and information structure are introduced, by way of preparation for the body of the paper.

1.2. Stress-assignment in German declaratives

I begin by providing background on stress-assignment in German declaratives. Example (1) shows a standard stress-pattern of all-new sentences in German. Each argument shows phrasal stress or accent as indicated by underlining. The last of these is strengthened to the strongest stress of the intonation phrase, which is shown by double underlining.

- (1) *What happened?*
[der Peter hat der Maria die Zeitung vorgelesen]_F
NOM Peter has DAT Maria the newspaper read-to
'Peter has read the newspaper to Maria.'

The pitch accents on the underlined elements are dramatically visible in pitch-tracks and are documented for many recordings in Truckenbrodt (2002, 2004, 2007) and Féry and Kügler (2008), among others. I here employ an account of them that is a development of Gussenhoven (1983, 1992), with results similar to those of Selkirk (1984, 1995), Uhmann (1991) and Jacobs (1993). It concentrates on stress/accent and ignores prosodic constituency, to keep things simple. There are two relevant constraints. STRESS-XP in (2) from Truckenbrodt (1995) requires that each syntactic lexical XP contains a beat of phrasal stress (phonologically speaking: stress at the level of the phonological phrase).¹ Phrasal stress is here identified with the occurrence of obligatory pitch accents in German and in English, and will also be called *accent* here. On the next higher prosodic level, that of the intonation phrase, NSR-I in (3) strengthens the rightmost accent/phrasal stress.² The higher level of stress assigned by NSR-I is called *sentence stress* or *nuclear stress* in the following.

- (2) STRESS-XP:
Each lexical XP must contain a beat of phrasal stress.
- (3) NSR-I:
The strongest stress in the intonation phrase falls on the rightmost phrasal stress.

For the example in (1), the lexical XPs are shown in (4).³ The effect of STRESS-XP is as follows. Each NP, and thus each name or noun without complement, receives phrasal stress by STRESS-XP. The final verb does not require phrasal stress by STRESS-XP because it is a head (V) and not an XP. With the accents on the arguments, STRESS-XP is also satisfied for VP in this example, since the VP contains phrasal stress on the objects in the VP. The application of STRESS-XP is non-cumulative. It assigns beats only on the lower level. A given beat of stress can satisfy STRESS-XP for a range of higher XPs containing it, such as here NP and VP. The rightmost phrasal stress, the one on *Zeitung*, is strengthened by NSR-I.

- (4) *Der* [_{NP} Peter] *hat* [_{VP} *der* [_{NP} Maria] *die* [_{NP} Zeitung] *vorgelesen*]
 the Peter has the Maria the newspaper read-to

The effect of STRESS-XP on the VP can be seen in (5). In (5a), the NP *Zeitung* in the object requires stress by STRESS-XP. This also satisfies STRESS-XP for the VP, which now contains stress on *Zeitung*. (5b) is important because it shows crucial stress-properties of indefinite pronouns and of the VP. STRESS-XP does not apply to functional projections such as the pronominal DP. STRESS-XP therefore does not require phrasal stress on the pronoun. STRESS-XP requires that the VP contains phrasal stress. This could in principle fall on the pronoun or on the verb. We must assume that the pronoun has the additional property of inherently rejecting phrasal stress, so that the verb receives the stress required by STRESS-XP in the VP. In (5c) the VP contains only the verb, which receives the stress required by STRESS-XP in the VP. In all of (5a–c) the NP *Maria* in the subject also receives stress by STRESS-XP. NSR-I strengthens the rightmost stress.

- (5) a. *die* [_{NP} Maria] *hat* [_{VP} *die* [_{NP} Zeitung] *gelesen*]
 the Maria has the newspaper read
 ‘Maria has read the newspaper.’
 b. *die* [_{NP} Maria] *hat* [_{VP} *etwas* gelesen]
 the Maria has something read
 ‘Maria has read something.’
 c. *die* [_{NP} Maria] *hat* [_{VP} gelesen]
 the Maria has read
 ‘Maria was reading.’

1.3. Semantic and prosodic effects of focus and givenness

The stress-pattern derived by STRESS-XP and NSR-I constitute a default that can be overridden by information structure. Jackendoff (1972) suggested that focus is marked by F and attracts the strongest stress in the sentence, as in (6). Rooth (1992) formulated the *alternative semantics* of focus, according to which the focus requires one or more alternatives to the focused constituent in the context. In (6), such alternatives may be Claudia, Hans and Peter: alternatives to Maria. The alternatives are furthermore computed relative to a *scope of the focus*, which is marked ~. The scope includes the focus and its background. Rooth does not employ the term ‘background’. I employ this term for the part of ~ outside of F. The background makes up the information that needs to be shared by the alternatives. In (6), the scope is the entire sentence of B and the background is, approximately, *hat die Zeitung gelesen* ‘has read the newspaper’. This needs to be shared by the alternatives, so that the required alternatives are of the form {Claudia hat die Zeitung gelesen, Hans hat die Zeitung gelesen, Peter hat die Zeitung gelesen, ...}. In a question-answer sequence like (6), these alternatives are present implicitly in the meaning of the question, which is formally identified with just such a set of possible answers (Hamblin 1973).

- (6) A: *Wer hat die Zeitung gelesen?*
 ‘Who read the newspaper to?’
- B: ~[*die* *Maria* *hat die Zeitung gelesen*]
 NOM Maria has the newspaper read
 ‘Maria has read the newspaper.’

An example with a smaller scope ~ is shown in (7). The focus on *Canadian* has semantic scope over [Canadian farmer], not over the entire clause. (7) also illustrates a point of Truckenbrodt (1995), namely that the semantic scope-domain of the focus is at the same time the phonological stress-domain of the focus: F attracts the strongest stress in the ~-domain, not necessarily in the entire clause or sentence. This is seen in (7), where Stress-XP and NSR-I lead to unmarked sentence stress on the final word *bar*. The focus on *Canadian* only changes the stress-relations within the scope of the focus, [Canadian farmer].

- (7) An American farmer and a ~[Canadian_F farmer] went to a bar.

In standard cases like (6), where the scope of the focus is the entire sentence uttered by B, the predictions of Jackendoff’s formulation and of Truckenbrodt’s refinement coincide: F attracts the strongest stress in its scope-domain, which in this case is the entire sentence.

I further adopt the suggestion of Féry and Samek-Lodovici (2006) that next to focus (F), givenness (G) is also marked in the syntax and has an effect on the prosodic structure.^{4,5} This position is also adopted in Selkirk (2008). As shown there, the status ‘discourse-new’ is unmarked in such a theory. Constituents not marked or dominated by ~ or G are discourse-new. (8), an example from Ladd (1983), illustrates the givenness effect. I add G-marking in B’s reply. Final stress on the object is the default, which can be seen in A’s question. It is derived by STRESS-XP and NSR-I. In the answer, the default is not found and stress is retracted to the verb instead. It is not plausible that the verb is focused here, since it does not have one or more contextual alternatives. It seems instead that the givenness of the object, *Fred*, leads to stress retraction to the verb.

- (8) A: What about [_{NP} Fred]?
 B: I don’t like Fred_G

I will assume that G rejects sentence stress and possibly accent.

For some examples discussed below, it is important to be precise about certain aspects of focus and givenness. This motivates the following remarks and suggestions. An often overlooked property of the semantics of focus of Rooth (1992) is that the assignment of F and ~ introduces a givenness requirement: The background must be contextually given by Rooth’s alternative semantics of focus. In (7), for example, Rooth’s semantics computes a set of alternatives to the focus {American farmer, Canadian farmer, Mexican farmer ...} = { $\lambda x P(x) \wedge \text{farmer}'(x)$ | $P \in D_{et}$ }. The semantics requires an antecedent in the context that is an element or a subset of this set of alternatives. Possible antecedents are American farmers, Mexican farmers, French farmers, but not John or Mary (who are not farmers), nor American dishwashers or Mexican teachers etc. It is plain that this focus demands an antecedent in which *farmer* is given. In the example at hand, *farmer* is the background, i.e. the part of the ~-domain that is not marked F. In (7) the focus interpretation finds this antecedent in the preceding constituent [American farmer], which, as required, also satisfies the givenness requirement that arises in ~[Canadian_F farmer].

Katz & Selkirk (in press) argue that the answer to a question can sometimes contain new elements outside of a focus. It is not clear how to analyze this in Rooth’s conception of focus. This case arises under complex conditions that, I believe, are not relevant to this paper. To simplify the discussion, I will therefore assume Rooth’s conception of focus with the consequences as outlined.

There is possible overlap between the prosodic effects of F and G and the indirect givenness effect of F, with open issues as to the exact analysis. This is not problematic in the current context. For example, in (6), the interpretation of the F-assignment requires that the background *hat die Zeitung gelesen* ‘has read the newspaper’ is contextually given. This givenness requirement is fulfilled in the

preceding question, which provides this background, along with the (implicit) alternatives. This given domain might or might not be independently G-marked. Either way, it is given material and it is destressed and deaccented.

Other than that, assignment of F and assignment of G are here assumed to interact freely. A constituent may be marked for one of the two, or for neither. A constituent can also be marked for both F and G, since they do not impose contradictory requirements.

In sum, I assume that STRESS-XP and NSR-I assign default stress, and that the pattern of default stress can be changed by F, which attracts sentence stress, and by G, which rejects sentence stress and possibly accent. We have furthermore seen in (5b) that an indefinite pronoun rejects accent.

I turn to the prosody of questions.

2. The study of questions in controlled contexts

2.1. Introduction to the study of questions in controlled contexts

The prosody and information structure of declaratives is regularly studied in controlled contexts. Some of the examples above are typical of this. As in (6), a preceding question is often employed to control the focus in the declarative answer sentence. As in (8), a preceding context may be employed to make a particular constituent contextually given in the following declarative test sentence.

There is much less understanding of how we can study the prosody of question in controlled contexts. The current section 2 seeks to add to the ground-work to this endeavor. It builds on two preceding studies of questions in controlled contexts, Jacobs (1991) and Hamlaoui (2011). The argument of Jacobs (1991) is reviewed in the following section. Before that, I here briefly address the study of Hamlaoui (2011). Its relevance to the current paper is that Hamlaoui shows that explicit contexts can be employed to control the givenness vs. newness of the non-*wh* part of a *wh*-question. Hamlaoui studies optional *wh*-movement in Francilian French (the French spoken in the Paris metropolitan area). She observes, among other things, that *wh*-in-situ option is preferred when the non-*wh* part of the sentence is contextually given. *Wh*-movement is marked in such a configuration. She analyzes this in terms of a dispreference for an initial *wh*-phrase followed by given material. It would require that the rightmost sentence stress falls on this given material. When the *wh*-phrase is in situ and final, on the other hand, it can naturally carry the rightmost sentence stress.

In the following sections, the study of questions in controlled contexts is employed and extended, and the following points will be made. (a) confirming and extending Jacobs (1991), the existential implicature of *wh*-questions is shown to be irrelevant to the stress of *wh*-questions (section 2.2.). (b) confirming and extending Haida (2007), *wh*-words in German single-*wh* questions are shown to be unaccented by default, while *wh*-words in situ in multiple-*wh* questions are shown to be accented by default (sections 2.3. and 2.4.). (c) Surprisingly and interestingly, *wh*-words enter into contextual relations with indefinite pronouns, with which they can either be contrasted by F-marking or they can be marked as given relative to them by G-marking. This sometimes results in an appearance of optional F-marking (section 2.5). (d) In the stress-patterns of embedded questions, it turns out to be relevant whether a question as a whole is given or new (section 2.6).

2.2 The irrelevance of the existential implicature for information structure

In asking the question *What did John bring?* the speaker assumes in some way that *John brought something*. Jacobs (1991) shows that this assumption is not the same as the background of a focus in the *wh*-question. If it were, the *wh*-word would carry (information structure) focus and would need to carry the sentence stress while the non-*wh*-part of the question would need to be destressed. This is not the case, as can be seen in the question in (9), which can be stressed in different ways. The translations are mine. Jacobs' example contains the German idiom *Brotzeit machen*, lit. 'make bread-time', which I translate as 'to eat'. Here and throughout, *i.*, *ii.*, *(iii.)* are used to separate examples that differ only in their stress-pattern. The first one is glossed. All are translated, with stress shown in the translation.

- (9) i. *Wer hat im Wohnzimmer Brotzeit gemacht?*
 Who has in-the living-room bread-time made
 ‘Who has eaten in the living-room?’
- ii. *Wer hat im Wohnzimmer Brotzeit gemacht?*
 ‘Who has eaten in the living-room?’
- iii. *Wer hat im Wohnzimmer Brotzeit gemacht?*
 ‘Who has eaten in the living-room?’

If can be seen that sentence stress need not be on the *wh*-word. Instead the stress of the question is determined by the actual context. Jacobs treats the assumption of *Who has eaten in the living-room?* that *Someone has eaten in the living-room* as an implicature.

Broad translations of Jacobs’ contexts that allow each of the three cases are shown in (10) – (12). As Jacobs shows, the stress-patterns make sense on the assumption that focus is assigned independently of the existential implicature, and that the background of the focus is contextually given. Thus, in (10) ‘make breadtime’ is new information and stressed by the regular stress rules (here: STRESS-XP and NSR-I). In (11), focus on *Wohnzimmer* has an alternative in the context, the bathroom. The predicate ‘make bread-time’ is contextually given in connection with this alternative. Finally, in (12), ‘making bread-time’ in the living-room is given in the context, and so can be in the background of a focus.

- (10) *Having found the living-room in a state not to his liking, A goes into the kitchen to ask B:*
Wer hat im Wohnzimmer Brotzeit gemacht?
 who has in-the living-room bread-time made

- (11) A: *The living-room is full of crumbs!*
 B: *The kids have left rests of food all over the apartment. In the bedroom Jens-Uwe smeared mustard on the drapes, Carmen ‘made bread-time’ in the bathroom and left stains of marmalade all over.*
 A: *Und wer hat im Wohnzimmer Brotzeit gemacht?*
 and who has in-the living-room bread-time made

- (12) *The state of the living-room leaves no doubt: ‘bread-time was made’ there. I have to ask:*
Wer hat im Wohnzimmer Brotzeit gemacht?
 who has in-the living-room bread-time made

In sum, Jacobs (1991) shows that the stress in a question is determined by its actual context, and is not influenced by the existential implicature. The latter is therefore not connected to information structure focus in the *wh*-question.

In the following, the argument of Jacobs is confirmed in a new way. The argument will raise a number of new questions that will be answered in the following sections.

Additional background to the discussion is an important, though perhaps little-known, observation that Höhle (1992: 112) that is illustrated in (13). An all-given utterance allows default stress, as in (13i). My account of this is that there is no given/new or given/focus dichotomy that directs stress to a particular constituent. Consequently, the syntactically and prosodic defaults (here: STRESS-XP and NSR-I) emerge in the placement of sentence stress. In the case at hand, they lead to stress on the final verb. As Höhle also shows, an all-given-sentence also allows verum focus on the finite verb in C, as in (13ii). Verum focus seems to involve focus on an element of the sentence that is associated with the truth of the sentence and to require a contrast to this claim of truth.

(13) A: *Hans hat etwas mitgebracht.*
'Hans brought something.'

B: i. *Ja, er hat etwas mitgebracht.*
yes he has something brought
'Yes, he brought something.'

ii. *Ja, er hat etwas mitgebracht.*
'Yes, he did bring something.'

Compare (13) to (14), where the clause spoken by B is not given in the context. Default stress is likewise assigned to the verb. Importantly, verum focus is not possible here. Verum focus requires that the remainder of the sentence is given. It is therefore impossible in (14ii), where the main verb is new.

(14) A: *Maria und Paul haben Hans zum Essen eingeladen.*
'Maria and Paul invited Hans to dinner.'

B: i. *Er hat etwas mitgebracht.*
he has something brought
'He brought something.'

ii. # *Er hat etwas mitgebracht.*
'He did bring something.'

I highlight this preparation for our analysis in (15). Notice that the requirement of verum focus that the rest of the sentence is contextually given follows from Rooth's conception of focus. If verum focus involves F-marking of a verum element in C and if the scope of the verum focus is the sentence, then all parts so of the sentence except for the verum element are in the background, and therefore must be contextually given.

- (15) a. All-given sentences allow default stress or verum focus (Höhle 1992).
b. Verum focus requires that the rest of the sentence is given.

Let us then turn to the questions in (16) and (17). In (16) the existential implicature is explicitly given as the preceding context. In (17), it is not given in the context. However, the context naturally fits the existential implicature: Often, when people are invited for dinner, they bring something. The sentences in (16) are particularly natural with the modal particle *denn*, which is added in brackets. This modal particle makes in particular the sentence (16ii) quite natural, while showing a minimum of markedness in connection with the stressed *wh*-word; the latter was already noted by (Höhle 1992: 118). These tendencies are indicated by subscripted # and are not further pursued here. All questions in (16) are also particularly natural without *denn* if prefixed with *und*, 'and'.

(16) *Implicature contextually given*

A: *Hans hat etwas mitgebracht.*
'Hans brought something.'

- B: i. *Was hat er (denn) mitgebracht?*
what has he MP brought
'What did he bring?'
ii. *Was hat er[#] (denn) mitgebracht?*
'What did he bring?'
iii. *Was hat er[#] (denn) mitgebracht?*
'What did he bring?'

(17) *Implicature not contextually given*

A: *Maria und Paul haben Hans zum Essen eingeladen.*
'Maria and Paul have invited Hans to dinner.'

- B: i. *Was hat er (denn) mitgebracht?*
what has he MP brought
'What did he bring?'
ii. # *Was hat er (denn) mitgebracht?*
'What did he bring?'
iii. # *Was hat er (denn) mitgebracht?*
'What did he bring?'

The distinction in possible stress-patterns between (16) and (17) confirms Jacobs' point in a new way. If the existential assumption of the speaker would be a focus presupposition, the stress-pattern should be the same in (16) and (17), regardless of whether the existential assumption is explicitly given as in (16) or not as in (17). However, the stress possibilities crucially differ between (16) and (17) depending on whether the context explicitly provides the existential implicature or not. More specifically, we see in (17) that the verb must be stressed if it is not contextually given.

I turn to some additional points and questions concerning (16) and (17). Notice that the *wh*-word is unaccented in (17i). Taking together Jacobs' example (10) and the example (17), we see that questions, outside of the *wh*-word, are stressed no different from declaratives. In particular, questions show stress on new elements, just like declaratives do.

Turning to (16), some initial analysis is provided here. This is refined in later sections. (16i) is here analyzed as an all-given stress-pattern. The contextually given verb is stressed, which suggests that the default rules of stress-assignment here provide default stress. This is possible only in the absence of any new and normally stress-bearing element (such as the arguments in (4)). Unlike the arguments in (4), the *wh*-word, which is not literally given in the context, must therefore at least have the option of being processed as given or as stress-rejecting in this example.

In (16ii), we see verum focus. Höhle (1991) already pointed out that verum focus is possible in *wh*-questions. The context makes the question apart from the *wh*-word given. It is surprising that the *wh*-word, which is not explicitly given in the context, can stand in the background of verum focus. This suggests that the *wh*-word can be processed as given. Below, I will provide an argument that that is indeed a possibility for *wh*-words in contexts like the one at hand.

In (16iii), we must assume that the *wh*-word is either processed as new (if that should be optionally possible) or that focus is here optionally assigned to it. The remainder of the sentence is given, and in both scenarios the *wh*-word would be stressed. I will argue below for an analysis in terms of focus on the *wh*-word.

2.3. A *wh*-word is by default unaccented in single-*wh* questions

In this section, the default stress of the *wh*-word in single-*wh* questions is discussed. Haida's (2007) observation that it is by default unaccented will be confirmed and put on a broader empirical and theoretical footing.

I argue for the position suggested by Bresnan (1971) that moved *wh*-words, when not affected by focus or givenness, act for stress purposes like pronouns. We may think of them as comparable to indefinite pronouns. In particular, *wh*-words, like (indefinite) pronouns, do not carry accent. They do not have an option of being processed as new and accented.

The strongest argument for this that I am aware of comes from the interaction of movement and stress discussed by Bresnan (1971, 1972). In the following I will sharpen and extend the argument. This will also give us an opportunity to solidify Bresnan's claim about the interaction of movement and stress by reviewing her argument with the addition of a controlled context.

Bresnan's interaction of stress-assignment with syntactic movement is found in German as well, and emerges against the background of stress-assignment by STRESS-XP, as discussed in Truckenbrodt and Darcy (2010). The examples in (18) and (19) are close to Bresnan's, here with an explicitly controlled context.⁶ In (18a), the moved object-*wh*-phrase *was für Bücher* carries accent on the NP *Bücher* due to STRESS-XP. The puzzle that motivates Bresnan's interaction of stress with movement is cast in the terms of this paper as follows. The VP contains only a trace of the object and the verb. We expect that Stress-XP, applied to VP, requires stress on the verb. Empirically, however, this stress on the verb need not be assigned. The reason for this cannot be contextual givenness of the verb since the verb is new in the now explicitly controlled context. Following Bresnan's perspective, we are led to say that stress in the VP is assigned as though the moved accented object was still inside of the VP, where it would satisfy Stress-XP for the VP and would thereby exempt the verb from requiring accent. Putting this slightly differently, we may say that the satisfaction of STRESS-XP is mediated by syntactic movement. The accent on the moved object counts towards the VP since the moved object originated within the VP. The formal analysis of this interaction with movement is left open here. However, the remainder of the argument takes the existence of this interaction with movement for granted and builds on it.

- (18) *Hans knows that she has been very active, though he doesn't know anything about the content of her academic occupation.*

| | | | | | |
|-----------|--------------------|--------------------------------------------|------------|----------------------------------------------------|------------|
| <i>Er</i> | <i>fragt sich,</i> | <i>[was für <u>Bücher</u>]_i</i> | <i>sie</i> | <i>[_{VP} t_i herausgegeben]</i> | <i>hat</i> |
| he | asks himself | what for books | she | edited | has |

'He wonders what books she has edited.'

I come to the second step of the argument. A single-word *wh*-phrase as in (19.i) acts as unaccented by comparison. For one thing, this is manifested in the intuition that it does not carry accent. However, since such intuitions are not quite as sharp as one would like in prenuclear position, it would be good to have independent support for the unaccented nature of the moved *wh*-word. One source of support is the following reasoning. If the *wh*-word did carry accent, this accent would, through the interaction with movement, exempt the final verb from carrying accent, and we would wrongly derive the stress-pattern in (19ii). The fact that we get (19i) instead can be understood in terms of the unaccented behavior of the *wh*-word: Even with the interaction with movement, there is no accent on the *wh*-word to be contributed (via the trace) to the VP, and so STRESS-XP requires accent on the verb. This confirms what we inferred from (16i,ii), (17i,ii) above: An unaccented version of a fronted *wh*-word is a natural option. In this reasoning, we have a first argument that the *wh*-word acts as unaccented.

- (19) *Hans knows that she has been very active, though he doesn't know anything about the content of her academic occupation.*
- i. *Er fragt sich, was_i sie [VP t_i herausgegeben] hat*
- ii. # *Er fragt sich, was_i sie [VP t_i herausgegeben] hat*
 he asks himself what she edited has
 ‘He wonders what she has edited.’

We can further strengthen this argument by additional reasoning about (19ii), i.e. the impossibility of having the pronoun as the only accented element of the question. (19ii) bears on the question whether an accented *wh*-word as in (16iii) is accented because it is processed as new, or because it is F-marked with information structure focus. If a fronted *wh*-word could be processed as new and accented, its accent in (19ii) would count towards the VP through the interaction with movement, and (19ii) would be acceptable. This is quite clearly not the case. If, on the other hand, the only way of accenting this fronted *wh*-word is by placing information structure focus on it, the focus will have the effect of requiring that the remainder of the sentence, including the verb, is contextually given. This will correctly predict the infelicity of (19ii), since the verb is not given in the context. We can therefore conclude that the *wh*-word in (19ii) can only be stressed by F-marking, and that there is no option of it being processed as new and thereby accented.

Notice then that (17iii) is a case of the same kind, even if we did not address the interaction with movement above. Here, too, it is an object *wh*-word that has moved. If it could be processed as new and accented, it would exempt the verb from requiring stress and (17iii) should be acceptable. The infelicity of (17iii), however, is as solid as the one in (19ii). Our analysis of (16iii) and (17iii) is then as follows. In both cases, the option of processing a *wh*-word as new and accented is excluded on general grounds, and with it, the option of licensing a stressless verb through the interaction with movement. In (16iii), this leaves an analysis in which the *wh*-word is assigned information structure focus. This is possible, since the remainder of the sentence is contextually given. It is not possible in (17iii), where the remainder of the sentence is not contextually given.

Thus, we have a clear argument that a *wh*-word can not be processed as new and accented, though, as we have seen, focus can be assigned to it in an appropriate context. This strengthens Bresnan’s classification of *wh*-words in a particular way. They act like pronouns. Pronouns are unaccented if they are not focused, they do not allow an option of being processed as new and accented. They do, however, allow the assignment of narrow focus to them. For stress purposes, then, we may think of moved *wh*-words as being like indefinite pronouns. This converges with the classification of German moved *wh*-words as unaccented by Haida (2007).

2.4. A *wh*-word in situ is by default accented in multiple *wh*-questions

An overview of syntactic and semantic issues discussed in the literature in connection with multiple-*wh*-questions can be found in Dayal (2005).

In a footnote on superiority effects, Chomsky (1995: 387) discussed the examples in (20), among others, and notes that “the *wh*-phrase in situ has focal stress (...); the preferred cases degrade when that property is removed”. (I owe this reference to Haida 2007: 182.)

- (20) a. *who saw what*
 b. *who did you persuade to do what*

Haida (2007: 51–52 and 180–191) discusses a range of German examples like (21) and (22). He observes that when sentence stress falls on the *wh*-word in situ, as in (21i) and (22i), the sentence unambiguously has a multiple-*wh*-question reading; without sentence stress on the *wh*-words, as in (21ii) and (22ii), the *wh*-word obligatorily takes on a reading as an indefinite pronoun in German.⁷

- (21) i. *Wer hat was gekauft?*
 who has what bought
 ‘Who bought what?’
- ii. *Wer hat was gekauft?*
 ‘Who bought something?’
- (22) i. *Wer sieht wen?*
 who sees who
 ‘Who sees who?’
- ii. *Wer sieht wen?*
 ‘Who sees someone?’

The examples discussed by Chomsky and by Haida do not show whether the stress-effect at hand is a requirement for accenting or a requirement for sentence stress on the *wh*-word in situ. Haida suggests that *wh*-words in situ in his multiple questions attract accent, and that they also show sentence stress due to rightmost strengthening (here: NSR-I). This turns out to be the correct formulation of the prosodic effect. In (23) and (24) we see examples in which the *wh*-word in situ is followed by an element that is new in the context. It is accented by STRESS-XP and the sentence stress now falls on this final accent by NSR-I, not on the *wh*-phrase in situ. However, the *wh*-phrase in situ is still accented, as predicted by Haida’s formulation. If the accent on the *wh*-word in situ is omitted in (23) and (24), the *wh*-word in situ receives an interpretation as an indefinite pronoun.

- (23) A: *Maria, Hans und Peter haben viele Gäste eingeladen.*
 ‘Maria, Hans and Peter invited many guests.’
- B: *Wer hat wem etwas mitgebracht?*
 who has whom something brought
 ‘Who brought something for whom?’
- (24) A: *Ich möchte einen Überblick über die Konferenzteilnehmer haben.*
 ‘I want to have an overview of the participants of the conference.’
- Wer hat wo ein Zimmer reserviert?*
 who has where a room reserved
 ‘Who made a reservation for a room where?’

English examples that make the same point are shown in (25) and (26).

- (25) *Let’s make a plan about how we proceed.*
Who will inform who about the new program?
- (26) *You were in the room during the entire afternoon. Tell me:*
Who was sitting where at the time of the murder?

In summary, we have seen that moved *wh*-words in single-*wh* questions act like pronouns in not carrying accent, while *wh*-words in situ in multiple questions require accent. The contrast will be analyzed in section 3.

2.5. F- and G-marking of *wh*-words

In this section I show a further result from the study of questions in controlled contexts. I argue that a *wh*-word can enter into a relation with an indefinite pronoun in its context in two ways: The *wh*-word can be F-marked and establish a contrast to the indefinite pronoun. Alternatively, and surprisingly, the *wh*-word can be G-marked and given relative to the indefinite pronoun.

We have already argued for a case of focus on a *wh*-word where the contrast is a preceding indefinite pronoun in (16iii). A further example is shown in (27), where it is clear that a contrast between the indefinite pronoun and the *wh*-word is established. Notice that the indefinite pronoun can also be focused due to the contrast with a *wh*-word.

(27) *Mary likes someone_F but we don't know who_F she likes.*

In the following, I develop two arguments that a givenness relation can be established between a *wh*-word and an indefinite pronoun. I begin by introducing some background to the arguments.

Broadly speaking, all-given stress patterns resemble all-new stress patterns. In the current analysis, Stress-XP and NSR-I derive the stress in both cases. However, if we look more closely, there is also a difference between all-new and all-given stress patterns. While all-new stress-patterns stress a preverbal object if there is one, all-given stress patterns also allow and sometimes even prefer verb stress. The preference seems to be stronger for definite objects as in (28) than for indefinite objects as in (29). Descriptively, we are led to say that the contextually given DP rejects sentence stress more strongly than the contextually given verb in these all-given sentences.

(28) A: *Hast du den Peter gesehen?*
'Did you see Peter?'

B: *Ja, ich habe den Peter gesehen.*
yes I have the Peter seen
'Yes, I saw Peter.'

(29) A: *Hast du ein Zimmer reserviert?*
'Did you make a reservation for a room?'

B: *Ja, ich habe ein Zimmer reserviert.*
yes I have a room reserved
'Yes, I made a reservation for a room.'

I leave open the exact source of this effect. It may relate to the difference between referential givenness of a DP vs. givenness of the concept or content of the verb (van Deemter 1994, Schwarzschild 1999), or it may relate to the scrambling of contextually given objects in German (Jäger 1995) and its consequence for stress assignment (Truckenbrodt and Darcy 2010). However, in one way or another, it must relate to the givenness of the preverbal object. I note for completeness that the objects in (28) and (29) carry optional accent and the stress shift to the verb is also seen when they are accented.

With this background, I turn to my first argument that *wh*-words can be G-marked relative to an indefinite pronoun in their context. We find a difference in the stress-behavior of a *wh*-word in situ depending on whether it has a corresponding preceding indefinite in the context, as in (30), or not, as in (31) and (32). In (30), there is a clear tendency towards shifting sentence stress to the verb as shown. This tendency is weaker in (31) (with an inference towards a similar preceding indefinite pronoun meaning) and not present in (32).

- (30) A: *Jemand hat etwas mitgebracht.*
 ‘Someone brought something.’
 B: *Wer hat was mitgebracht?*
 who has what brought?
 ‘Who brought what?’
- (31) A: *Er hat es mitgebracht.*
 ‘He brought it.’
 B: *Wer hat was mitgebracht?*
 who has what brought?
 ‘Who brought what?’
- (32) A: *Maria, Hans und Paul haben diese drei Gerichte mitgebracht.*
 ‘Maria, Hans and Paul have brought these three dishes.’
 B: *Wer hat was mitgebracht?*
 who has what brought?
 ‘Who brought what?’

The stress-pattern in (30) is unexpected relative to Haida’s observation (cf. (21i)) and its account: So long as we are not dealing with an all-given utterance, the *wh*-word in situ will carry accent, exempt the following verb from being stressed, and will be strengthened to sentence stress by NSR-I. We are therefore led to conclude that the *wh*-word in situ in the all-given sentence (30), while showing the effect of inherent accent attraction, rejects sentence stress because it is also G-marked. The G-marking in question must be specifically with regard to a preceding indefinite pronoun, because it occurs in (30), less so in (31) and not in (32). The G-marking shifts the sentence stress to the verb in (30), in parallel to (28) and (29).

My second argument is as follows. Consider verum focus in a multiple-*wh*-question as in (33) and (34). We now expect a difference between verum focus in the presence of preceding indefinites as in (33) and a pair-list configuration like (34). We expect that the *wh*-words can be G-marked in (33) and thus legitimately stand in the background of the verum focus. (34) does not provide for G-marking in the same way and so should be ruled out because verum focus requires givenness of its background. There is indeed a striking difference between the two cases in the expected direction. It is a difference between problematic in (33) and impossible in (34). There is an independent reasons why (33) is marked to begin with. The required structure is prosodically marked because of the presence of accent on the *wh*-word in situ that must here follow the nuclear stress of the verum focus. I note that the postnuclear accents in (33) might be assigned in a way that resembles second occurrence focus as shown in Féry and Ishihara (2009): Without a pitch accent but with measurable effects on the duration. Intuitively, their presence seems to be quite noticeable. In the preferred rendition of (33), there is a slow-down after the nuclear stress and slow, measured renditions of the two following words. On the other hand, there is no postfocal rendition that makes the multiple-*wh*-questions in (34a.i) and (34b.i) acceptable with verum focus. These require renditions without verum focus, as in (34a.ii) and (34b.ii).

- (33) A: *Jemand hat etwas mitgebracht.*
 ‘Someone brought something.’
 B: (#) *Und wer hat was mitgebracht?*
 and who has what brought?
 ‘And who did bring what?’

(34) A: *Maria, Claudia und Hans haben diese drei Gerichte mitgebracht.*
 ‘Maria, Claudia and Hans have brought these three dishes.’

B: a. i. ## *Und wer hat was mitgebracht/mitgebracht?*
 and who has what brought
 ‘And who did bring what?’

ii. *Und wer hat was mitgebracht?*
 ‘And who brought what?’

b. i. ## *Und wer hat welches Gericht mitgebracht/mitgebracht?*
 and who has which dish brought
 ‘And who did bring which dish?’

ii. *Und wer hat welches Gericht mitgebracht?*
 ‘And who brought which dish?’

This provides further support that *wh*-words can be marked for givenness. The *wh*-words can stand in the background of verum focus only where the context licenses such givenness as in (33).

We have then seen motivation that a *wh*-word can enter into a relation of contrast with an indefinite pronoun in its context, and motivation that a *wh*-word can also enter into a relation of givenness relative to such a pronoun. Observe, then, that it seems that a *wh*-word can sometimes engage in either of these two relations with the same antecedent pronoun. Consider again (16). In (16ii), we now assume that the *wh*-word enters into a givenness relation with the indefinite pronoun *etwas* in the context. This analysis is motivated by the fact that the *wh*-word is allowed in the background of verum focus here. Recall also that we found confirmation in (33) and (34) that givenness of *wh*-words is crucial for their being acceptable in the background of verum focus. For (16iii), it was argued earlier that the *wh*-word is focused. The contrast is clearly the preceding indefinite pronoun. Thus, this context allows a free choice between givenness relative to an indefinite pronoun antecedent, or contrast with that same indefinite pronoun!

This leads us to an analysis of why the assignment of focus appeared to be optional in (16iii). In other cases, the presence of an alternative in the preceding context leads to obligatory F-assignment (cf. *Mary likes John. Sue_F likes John (too)*). Sauerland (2004) and Wagner (2005) suggest to relate obligatory assignment of information structure to presupposition maximization (Heim 1991). For our purpose: If you can add a presupposition by assigning F, you must, because you introduce more presupposition than you would without F. Let us adopt this. Why, then, does F-assignment appear to be optional in (24)? The answer is already there: The alternative here is not doing nothing. The alternative is assigning G, which introduces a different presupposition (and one that is not entailed by the presupposition of F). This alternative is therefore not blocked by presupposition maximization.

How can an element be allowed to choose between a givenness relation and a relation of contrast relative to one-and-the-same other element? Consider the approximate meanings of the sentences in (16), shown in (35). The question-meaning broadly follows Karttunen (1977). There is a significant shared element of the indefinite and the *wh*-word, which is underlined.

(35) a. *Hans brought something:* $\wedge \exists x, \text{thing}'(x) \wedge \text{bring}'(h, x)$
 b. *What did Hans bring:* $\{p \mid \neg p \wedge \underline{\exists x, \text{thing}'(x)} \wedge p = \wedge \text{bring}'(h, x)\}$

There is of course also a meaning difference between an indefinite pronoun and a *wh*-word, and it is reasonable that this difference should be the basis of a contrast due to information structure focus. If we assess intuitively what this contrast amounts to in (27), it seems that the nonspecific indefinite ‘someone’ contrasts with ‘who’ in the sense of ‘the particular person for whom this is true’. It is not unreasonable that either the common element or the element that separates them can be employed to establish a relation of information structure to the indefinite pronoun.

This reasoning leads us to expect that the relation is symmetrical. An indefinite pronoun should sometimes have the same two options when there is a *wh*-phrase in its context. This appears to

be correct, as shown in (36). Descriptively, focusing the indefinite pronoun is possible as in (36ii) but appears to be optional, as shown in (36i). The analysis we are led to is that the indefinite is G-marked in (36i) relative to the *wh*-word in its context. F-marking is then optional in this context because the alternative is G-marking.

- (36) A: *Weißt du wen sie mag?*
 ‘Do you know who she likes?’
- B: i. *Nein. Aber ich weiß, dass sie jemanden_G mag.*
 no but I know that she someone likes
 ‘No. But I know that he likes someone.’
- ii. *Nein. Aber ich weiß, dass sie jemanden_F mag.*
 ‘No. But I know that she likes someone.’

The fact that we arrive at a coherent analysis of the optionality of F-marking of *wh*-words and indefinites lends support and coherence to the earlier findings: *Wh*-words can engage an indefinite in their context either in a relation of contrast, or be marked as given relative to them.

For completeness, let us then briefly go back to make sure that there is still evidence for the unaccented behavior of moved *wh*-words when neither F nor G is assigned to them. (16ii) is no longer evidence for this, since the *wh*-word is G-marked here. Our analysis also has the consequence that (16i) involves a G-marked *wh*-word. Not assigning F or G is not an option in this context because presupposition maximization forces the assignment of F or G. (16i) is then genuinely an all-given sentence. However, it does not provide evidence for the stress-behavior of informationally neutral *wh*-words. Cases without a corresponding indefinite pronoun in the context are (17i) and (19.i). Since we now have a sense of when G is assigned to *wh*-words, we can say with some confidence that G is not assigned here, so that these provide evidence for the stress-behavior of the moved *wh*-word when no special information status is assigned to it.

2.6. Newness vs. givenness of the question as a whole

To further demonstrate the advantages of working with controlled contexts, and to present another initial result of this method, I turn to embedded questions in this section. In this domain, we can learn something about the information status of questions in their entirety.

To begin with, a question may simply be given by having been introduced before. In that case, its givenness requires destressing of the entire question, as shown in (37).

- (37) *Maria weiß, was er mitgebracht hat.*
 ‘Maria knows, what he brought.’
- i. *Claudia weiß auch, was er mitgebracht hat.*
 Claudia knows also what he brought has
 ‘Claudia also knows what he brought.’
- ii. # *Claudia weiß auch, was er mitgebracht hat.*
 ‘Claudia also knows what he brought.’
- iii. # *Claudia weiß auch, was er mitgebracht hat.*
 ‘Claudia also knows what he brought.’

The opposite extreme is shown in (38). Here no part of the embedded question is given in the context. As expected, the new verb of the embedded question requires stress.

- (38) A. *Maria und Paul haben Hans zum Essen eingeladen.*
 ‘Maria and Paul invited Hans to dinner.’
- B. i. # *Weißt du was er mitgebracht hat?*
 know you what he brought has
 ‘Do you know what he brought?’
- ii. # *Weißt du was er mitgebracht hat?*
 ‘Do you know what he brought?’
- iii. *Weißt du was er mitgebracht hat?*
 ‘Do you know what he brought?’

Consider then (39), where the existential implicature of the embedded question is given in the context. We have learned in the preceding discussion that in such a case, all parts of the question separately can be treated as given by the context. That includes the *wh*-word, which has the option of being G-marked relative to the preceding indefinite pronoun. We might then expect that such a question can generally remain stressless. In fact, however, this depends on the matrix verb. The verb *wissen*, ‘to know’ allows an embedded question entirely without stress, as in (39a), while *sich fragen*, ‘to wonder’ does not, as in (39b).

- (39) A: *Hans hat etwas mitgebracht.*
 ‘Hans brought something.’
- B: a. *Ich weiß was er mitgebracht hat.*
 I know what he brought has
 ‘I know what he brought.’
- b. # *Ich frage mich was er mitgebracht hat.*
 I ask myself what he brought has
 ‘I wonder what he brought.’

We are led to assume that there is a further factor at play. A reasonable analysis is that this factor is G-marking of the question as a whole. We may say that an entirely stressless question requires not only the givenness of its parts but in addition G-marking of the syntactic CP that is the (embedded) question. A reasonable assumption is that this G-marking of the entire question requires a preceding identical question in the context. This would make sense of the difference in (39) as shown in (40). In both (39a) and (39b) the stressless given question would need to be accommodated for the absence of stress to be possible. The result of accommodation of the stressless question is shown in (40a) and (40b) in the second line each. It can be seen that this leads to a coherent discourse in the (40a), which seems like a good rendition of (39a). In (40b) it leads to a deviant discourse: The matrix clause ‘I wonder’ seems to introduce a question into the discourse. The accommodation of givenness seems to conflict with this.

- (40) a. A: Hans brought something.
 A and B: What did he bring? (silent, accommodated)
 B: I know [what he brought]_G
- b. A: Hans brought something.
 A and B: What did he bring? (silent, accommodated)
 B: # I wonder [what he brought]_G

While givenness cannot easily be accommodated in other cases, it is not unreasonable that givenness of the embedded question is accommodated in (40a): A’s utterance *Hans brought something* may be said to introduce the possible silent question *What did he bring?*. Accommodation of the givenness of

B's embedded question in *I know what he brought* is then merely the enhancement of the status of this possible silent question to a real silent question. In this fashion, A's preceding utterance and B's following utterance may work together to introduce the silent question between them. In (40b), A's utterance and B's embedded question are the same as in (40a), but B's matrix predicate *I wonder* is not compatible with such accommodation. Here the possible silent question cannot be turned into a real silent question.

Consider for completeness also other possible stress-patterns of the same sentences, shown in (41) and (42). The pattern in (41i) seems to be less stable than the others, but it seems to be real. Verum focus is not shown. It does not seem to arise in embedded verb-final *wh*-questions more generally.

- (41) A: *Hans hat etwas mitgebracht.*
 'Hans brought something.'
- B: i. (#) *Ich weiß was er mitgebracht hat.*
 I know what he brought has
 'I know what he brought.'
- ii. *Ich weiß was er mitgebracht hat.*
 'I know what he has brought.'
- (42) A: *Hans hat etwas mitgebracht.*
 'Hans brought something.'
- B: i. *Ich frage mich was er mitgebracht hat.*
 I ask myself what he brought has
 'I wonder what he brought.'
- ii. *Ich frage mich was er mitgebracht hat.*
 'I wonder what he brought.'

These stress-patterns are compatible with our analysis. The questions as a whole are not G-marked here, and so must be stressed somewhere under our assumptions. Where this stress falls depends on whether the *wh*-word is G-marked or F-marked. In (41i) and (42i), we take the *wh*-word to be G-marked in relation to the preceding indefinite, so that all parts of the question are G-marked. Here STRESS-XP and NSR-I assign default stress to the final verb. In (41ii) and (42ii) we take the *wh*-word to be F-marked in relation to the preceding indefinite. The F-feature attracts the stress within the embedded question.

In summary, it seems that destressing a question in its entirety requires givenness not only of its parts but in addition givenness of the question in its entirety.

This concludes the first half of this paper. Earlier results were confirmed and new results were obtained with the study of *wh*-questions in controlled contexts: Confirming Jacobs (1991), the existential implicature of *wh*-questions does not affect the stress-pattern. Confirming Haida (2007), *wh*-words are unaccented after *wh*-movement in single-*wh* questions, while *wh*-words are accented in situ in multiple-*wh* questions. Further, *wh*-words can be F-marked and contrast with an indefinite pronoun in their context, and they can be G-marked and be given relative to an indefinite pronoun in their context. Finally, the stress-pattern of embedded questions is affected by whether or not a question as a whole is contextually given.

3. *Wh*-inherent F

In this section, an account is developed of the difference between the unaccented *wh*-words in single-*wh* questions and accented *wh*-words in situ in multiple *wh*-questions. The account starts from the suggestion in the literature that *wh*-words always carry an inherent F-feature, here called *wh*-inherent F. Two authors defending this suggestion are Sabel (2006) and Haida (2007). They discuss a large

range of languages in which *wh*-phrases and focused phrases form a natural class in the syntax. In various languages, including Italian (Rizzi 1997) and Hungarian (Kiss 2002), focused phrases and *wh*-phrases move to the same position in the left periphery. In a range of other languages, focus particles mark not only focused phrases but also *wh*-phrases. The natural class is normally seen as defined by F, on the assumption that *wh*-phrases carry an inherent feature F.

Based on this assumption, a prosodic account of *wh*-inherent F and of the difference between moved *wh*-words and *wh*-words in situ in German is developed as follows.

In section 3.1. some remarks on the nature of *wh*-inherent F provide background to the discussion. In section 3.2. cross-linguistic discussion motivates the assumption that information structure F and *wh*-inherent F share their prosodic behavior. Among other things, it will be seen that both show the same prosodic effect in Japanese, which can be analyzed as attraction of sentence stress. In section 3.3. a revised formulation of the prosody of F is developed that generalizes across information structure focus and *wh*-inherent F. A crucial element of this revision is that movement to Spec,FocP is an alternative to focus prosody. In section 3.4. the prosodic suggestions for F by Haida (2007) are discussed. In section 3.5. a consequence of the account for the morphosyntax of *wh*-inherent F is highlighted.

3.1. Remarks on the nature of *wh*-inherent F

It seems that fronted *wh*-words are stressed according to their pronominal nature. By comparison, the *wh*-words in situ seem to show a prosodic focus effect, as in Chomsky's formulation. However, this is not an effect of information structure focus. In the examples (23) – (26), there are no antecedents for a contrast on the *wh*-words in situ. Equally strikingly, information structure focus would lead us to expect that the constituents following the focus must be given as part of the background of the focus. We see, on the contrary, in (23) – (26), that the following constituents are here contextually new and that they are also stressed by STRESS-XP and NSR-I like new constituents. Thus, if this accent is a focus effect, as in Chomsky's formulation, it is different from the information structure focus that we know.

I therefore follow the assessment of Haida (2007) that *wh*-inherent F is part of the interrogative interpretation and has no information structure consequences. It does not require alternatives in the context and it does not require givenness of the 'background' in its scope. It must be separated from information structure F. The inherent accent on *wh*-phrases in situ in multiple-*wh* questions will be analyzed as an effect of *wh*-inherent F.

To be clear: In section 2 we also discussed F-assignment to a *wh*-word in relation to an indefinite in its context. This is information structure F. *Wh*-words marked with such information structure F thus carry two F-features: An inherent one (*wh*-inherent F) and an externally assigned information structure F. *Wh*-phrases without such information structure F only carry one F-feature, namely *wh*-inherent F. In the current section we are interested in the prosodic effects of *wh*-inherent F.

While *wh*-inherent F does not share the information structure interpretation with information structure F, it does seem to share the prosody of information structure F. We see an indication of this in the accent-attracting behavior of *wh*-words in situ in multiple-*wh* questions. The prosodic parallel between the two kinds of F is strengthened in the following section, before an account of it is developed in section 3.3.

3.2. Parallels in the prosody of *wh*-inherent F and information structure F

This section argues that cross-linguistic data suggests that *wh*-inherent F and information structure F are parallel in their prosody.

Cheng and Downing (to appear) show that in Zulu both focused constituents and *wh*-phrases must occur in a position that immediately follows the verb. The verb also forms a prosodic phrase with the following focus or *wh*-phrase, which in both cases is followed by an obligatory edge of the prosodic phrase. Cheng and Downing argue for an analysis in which the *wh*-phrases are inherently focused, and in which prosodic and interpretational constraints account for the word order and prosodic restrictions.

In Turkish, a *wh*-in-situ language, *wh*-phrases share with focused constituents a preference for immediately preverbal placement and the attraction of sentence stress (Göksel and Kerslake 2005, see also Kornfilt 1997).

In Tokyo Japanese, likewise a *wh*-in-situ language, *wh*-words similarly share the prosody of focused phrases. In the following, I review the well-documented Japanese case in some detail. This will be relevant to the account below, which is designed to cover the focus prosody on Japanese and Turkish *wh*-phrases as well as the focus effect on *wh*-phrases in situ in German.

The prosody of Tokyo Japanese has been the subject of a number of experimental studies, including Pierrehumbert and Beckman (1988), Kubozono (1989, 1993), and Ishihara (2003, 2007). Narrow focus has an appreciable effect on the sentence melody. It raises the peak of a lexical accent in focused position (or the height of the entire word if it is unaccented), which is particularly noticeable in a position that would otherwise be downstepped; see Pierrehumbert and Beckman (1988), Ishihara (2003, 2007). Further, it reduces the tonal height of later peaks; see Ishihara (2003).

These effects are illustrated with the examples and pitch-tracks in Figures 1 and 2, from Ishihara (2003: 30–31). The sentences are the same, except for narrow focus on *aniyome-ni* in Figure 2. The pitch-tracks show how this narrow focus leads to a dramatically higher peak on the focus in Figure 2 in comparison to the downstepped peak on the same word in Figure 1. Further, the peaks following the focus are reduced in Figure 2 by comparison with Figure 1.

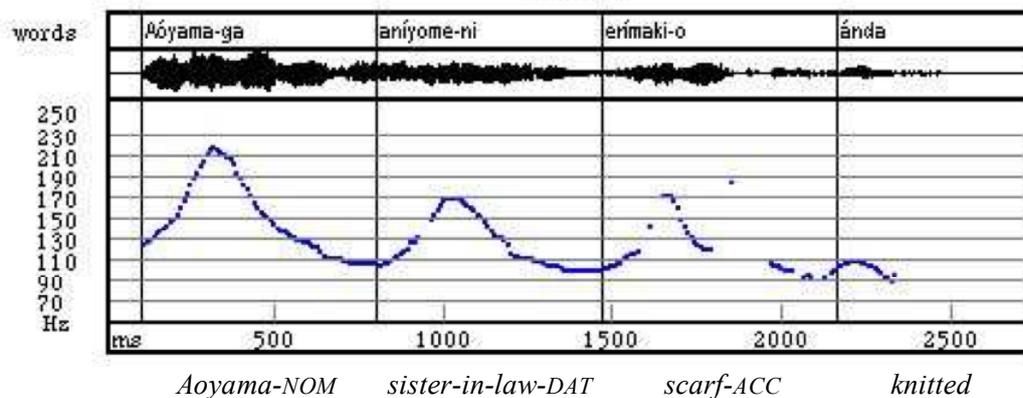


Figure 1. Sentence with no narrow focus
'Aoyama knitted a scarf for his sister-in-law.'

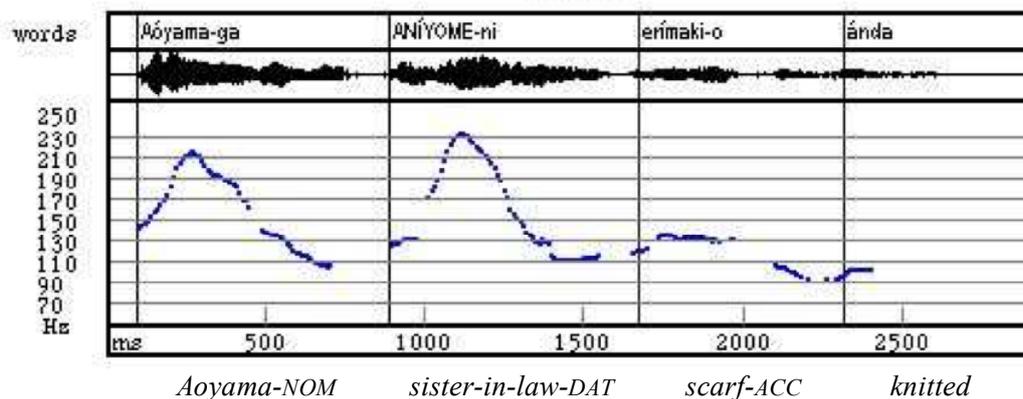


Figure 2. Sentence with narrow focus on the dative object
'Aoyama knitted a scarf for his SISTER-IN-LAW.'

What is important for this paper is that *wh*-phrases do not undergo *wh*-movement in Japanese, and that they obligatorily show focus prosody, i.e. their prosody is the same as the prosody of a phrase in narrow focus (Ishihara 2003).⁸ This is shown in Figures 3 and 4 with examples from Ishihara (2003: 52–53). Figure 3 shows the intonation of a non-interrogative clause with an indefinite expression in object position. Figure 4 shows a *wh*-question with a *wh*-phrase in object position. The comparison of

the two shows the effect of the focus prosody on the *wh*-object in Figure 4: Raising of the *wh*-phrase and the reduction of the following peaks. The arrow illustrates the raising and the gray shading highlights the area of reduction. These are from Ishihara's original.

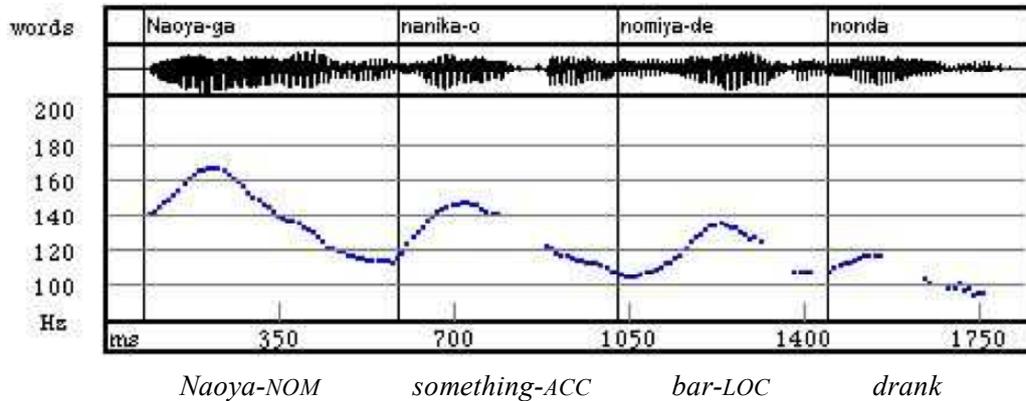


Figure 3. Statement with an indefinite pronoun as direct object
 'Naoya drank something at the bar.'

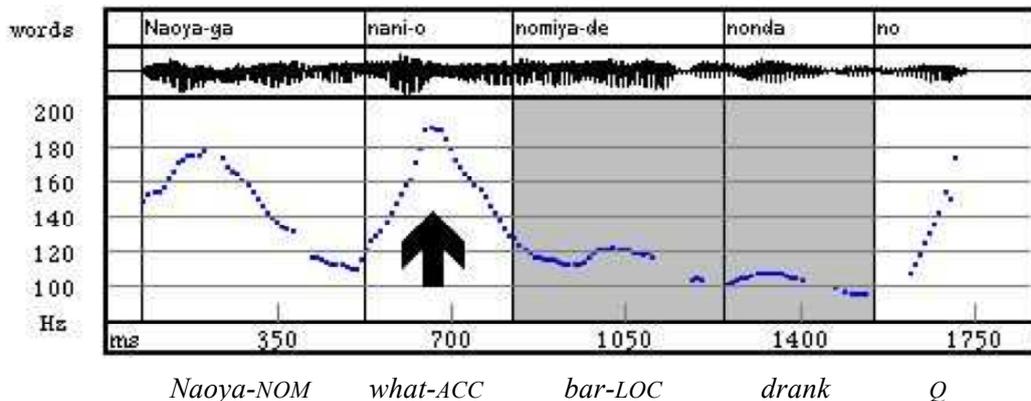
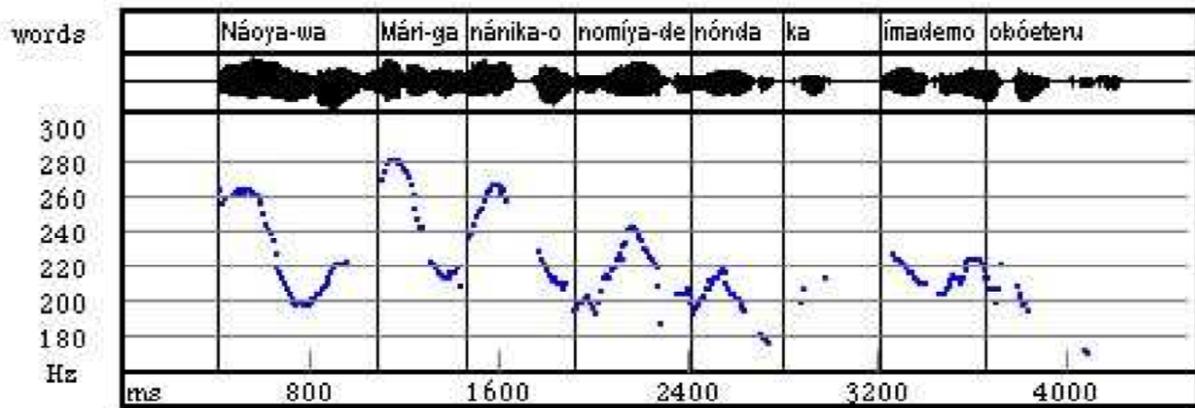


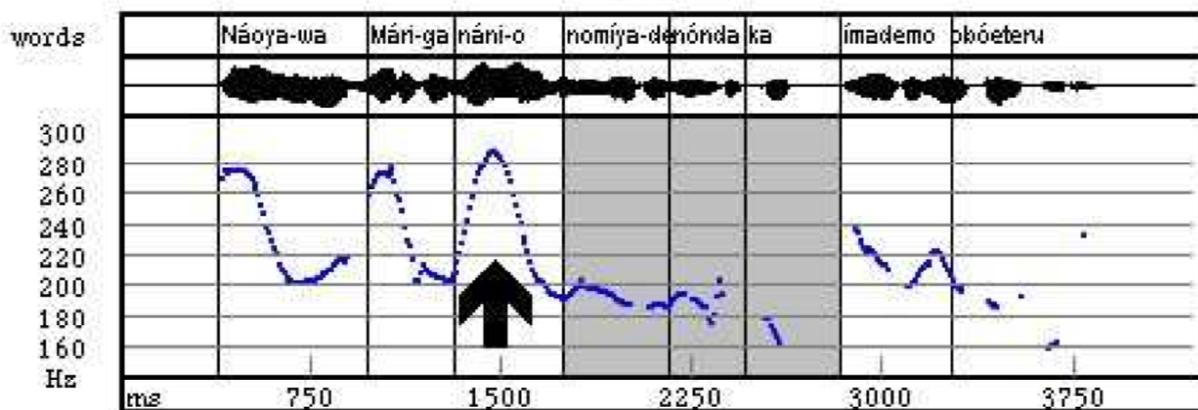
Figure 4. *Wh*-question with the *wh*-word in direct object position
 'What did Naoya drink at the bar?'

The focus prosody is likewise obligatory with embedded *wh*-questions, as shown in Figures 5 and 6, from Ishihara (2003: 55–56). Figure 5 shows an embedded yes/no-question, which does not require focus prosody. Figure 6 shows an embedded *wh*-question, with focus prosody on the *wh*-word. According to Ishihara, the prosodic focus effect extends to the end of the embedded question, but no further. Thus, in Figure 6, the reduction of peaks following the focus ends with the end of the embedded interrogative.



Naoya-TOP [Mari- some- bar-LOC drank Q] even.now remember
NOM thing-ACC

Figure 5. Embedded yes/no-question
 ‘Naoya still remembers [whether Mari drank something at the bar].’



Naoya-TOP [Mari- what- bar-LOC drank Q] even.now remember
NOM ACC

Figure 6. Embedded *wh*-question
 ‘Naoya still remembers [what Mari drank at the bar].’

I will return to the relevance of the sensitivity of this effect to a scope domain. For now, the crucial point of the Japanese data is that *wh*-phrases of Japanese *wh*-questions obligatorily trigger the same prosody as information structure focus. This is furthermore similar to the *wh*-phrases in Zulu and Turkish, which also seem to show the same prosody as information structure focus.

3.3. A refined picture of the prosodic effects of information structure focus

We are now looking for the correct formulation of the prosodic effects of F across information structure F and *wh*-inherent F. An account is developed in this section.

First, we require a refinement of the prosody of F for cases of multiple focus (see Krifka 1991 for an account of the semantics of multiple focus), which is to extend to the prosody of multiple-*wh* questions. Consider the example of Schwarzschild (1999) in (43). Here each focus requires an accent.

(43) *John cited Mary but he DISSED_{F1} SUE_{F2}.*

I follow the suggestion of Schwarzschild (1999: 170) that each F-marked constituent (for Schwarzschild: FOC) requires accent.

Schwarzschild’s formulation that each F attracts accent seems to target the appropriate prosodic level in German. Non-final foci seem to be happy when they carry an accent as in (44). See

Selkirk (2005) for a different suggestion based on different examples and see Kabagema-Bilan, López-Jiménez & Truckenbrodt (2011) for a comparison of the suggestions.

- (44) A: *Wer hat was mitgebracht?*
 ‘Who has brought what?’
- B: *Hans_F hat einen Salat_F mitgebracht, Maria_F hat einen Auflauf_F mitgebracht, ...*
 Hans has a salad brought Maria has a casserole brought
 ‘Hans has brought a salad, Maria has brought a casserole, ...’

The formulations in (45) capture these observations.

- (45) Prosodic effects of F (to be revised):
- a. ACCENT-F (following Schwarzschild 1999)
 Each F-marked constituent must carry accent (phrasal stress).
 - b. FOCUS (revising Jackendoff 1972/Truckenbrodt 1995)
 In each domain \sim , the strongest stress must fall on *some* constituent marked F.

We now have a demand on each F to carry accent in (45a). The original effect of attraction of the strongest stress, now stated in (45b), is here cast as a prosodic demand on each scope domain (rather than on each F). It need not be satisfied for each F, but only for one F in the scope domain. In a standard case like (42), with only a single F, this will amount to attraction of the strongest stress in the scope domain by the single F due to FOCUS. ACCENT-F is trivially satisfied for a single F where the stronger demand FOCUS is satisfied. For multiple foci in a single scope domain as in (43) and (44), FOCUS requires that one of them carry the strongest stress in the scope domain, while additional foci need to carry accent by ACCENT-F. This seems to be appropriate for the cases discussed here.

I extend the account from information structure F to *wh*-inherent F. I analyze the focus effect of the *wh*-word in situ in multiple *wh*-questions as an effect of ACCENT-F in (45a). The F-feature in the *wh*-word in situ attracts accent. At the same time, in German single and multiple *wh*-questions, we do not find an effect of FOCUS in (45b). Yet we know from Japanese and Turkish that *wh*-inherent F can (and in these languages will) unfold a full effect of FOCUS, i.e. it will attract sentence stress. We also find this on information structure focus in situ in German, English, Japanese and Turkish. Why do we not observe it on *wh*-phrases in German and English? The generalization seems to be that F in situ attracts sentence stress, as in information structure F in German, English, Japanese, Turkish and in *wh*-inherent F in Japanese and Turkish. On the other hand, the presence of *wh*-movement in English and German makes this prosodic effect of FOCUS go away.

This converges with the results and the account of Hiraiwa and Ishihara (2002, to appear). They argue that Japanese focus clefts involve syntactic movement of the focused constituent. They also show for declaratives that Japanese focus clefts do not show focus prosody, unlike Japanese focus in situ. They cast their discussion in terms of two alternative ways of focusing: by focus movement to Spec,FocP or by focus prosody.

I adopt the idea of a disjunction between focus prosody and focus movement and incorporate it into the formulation of FOCUS in (46).

- (46) FOCUS (final version):
 In each scope domain of one or more F-features, either (a) or (b) must be satisfied:
 (a) the scope domain is FocP and *some* F moves to Spec,FocP, or
 (b) the strongest stress in the scope domain falls into *some* constituent marked F.

In a single-*wh*-question in German, there is then no attraction of sentence stress to the *wh*-word by (46b) because (46a) is satisfied instead: the F of the initial *wh*-word has moved to Spec,FocP.

In a multiple-*wh*-question in German, there is also no attraction of sentence stress to any *wh*-word by (46b), since, again, (46a) is satisfied instead: The F in the initial *wh*-word has moved to Spec,FocP. Since FOCUS, as formulated in (46), is a requirement on the scope, it need therefore not be satisfied for every F, but only for one F in each scope domain. In a multiple-*wh*-question, FOCUS is

satisfied for the scope, since one F in an initial *wh*-word has moved to Spec,FocP. With FOCUS satisfied, there is therefore no requirement to put sentence stress on any F. The *wh*-word in situ will therefore also not attract sentence stress. Consequently, later elements in the sentence may also be accented and may then receive the sentence stress.

Independently, however, ACCENT-F still applies to each F. This has the correct consequence for the *wh*-phrase in situ, which thereby will attract accent. Thus, we can derive the reduced focus effect we diagnosed there.

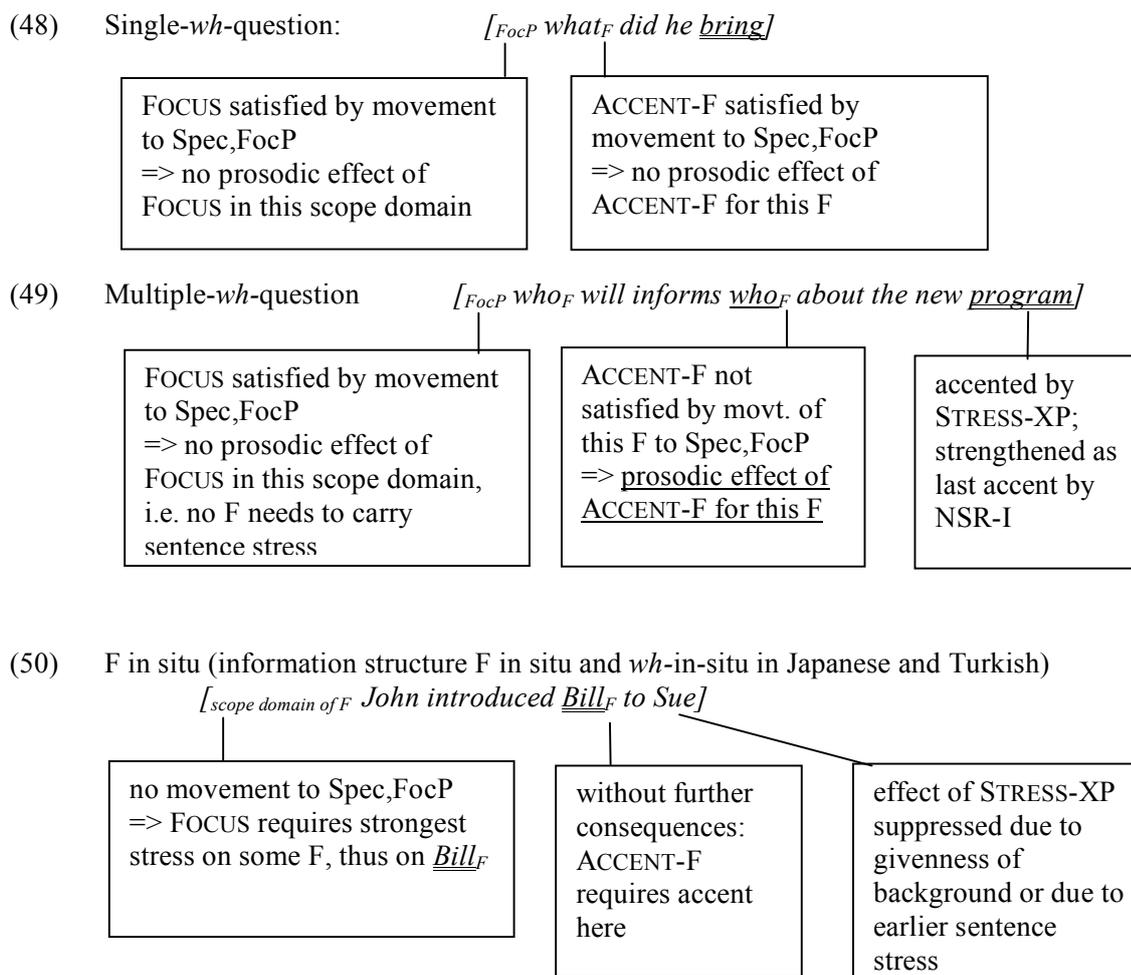
However, we do not want ACCENT-F to apply to the initial *wh*-word in a single-*wh*-question: We saw that such an initial *wh*-word may, and typically will, occur without accent. This leads us to revise ACCENT-F in a parallel fashion, as in (47). Here we add the same disjunction that we added to FOCUS in (46): Movement to Spec,FocP is an alternative to the prosodic effect.

- (47) ACCENT-F: (final version)
 For each F, either (a) or (b) must be satisfied:
 (a) the scope domain is FocP and F moves to Spec,FocP
 (b) F contains an accent.

As desired, this exempts the initial *wh*-word in single-*wh*-question from being accented. It does not exempt the *wh*-word in situ in multiple-*wh*-questions from being accented.

The full focus effect is correctly predicted for information structure F in situ and for *wh*-inherent F in *wh*-in-situ languages like Japanese and Turkish. In the absence of movement to Spec,FocP, (46a) does not apply and so (46b) needs to apply, assigning sentence stress to the focus or *wh*-word.

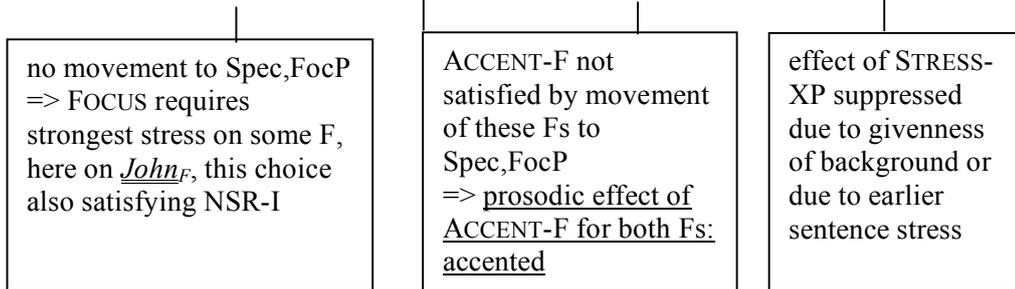
The analysis of the different cases is summed up in (48) – (51), using English for illustration.



(51) Multiple F in situ:

You will inform Bill about the new program,

and [_{scope domain of Fs} she_F will inform John_F about the new program]



Thus, we are led to the interesting perspective that the prosodic requirements on F (i.e. FOCUS and ACCENT-F) are part of more abstract relations between F and its scope domain, which can alternatively be satisfied by movement to Spec,FocP. The result is a refinement of the formulations of Hiraiwa and Ishihara (2002, to appear). For them, movement to Spec,FocP and focus prosody are alternative ways of focusing. Multiple-*wh*-questions in German show an intermediate case in multiple-*wh*-questions, with some prosodic F-effect but also with less than a full prosodic F-effect, due to the independent presence of an additional initial *wh*-phrase. This can be captured if the disjunction between movement and prosody is not tied to F-assignment as such but to the visible surface consequences of F-assignment.

Further analysis of the F-feature that is inherent in *wh*-phrases is developed in Truckenbrodt (to appear).

3.4. Remarks on Haida's suggestions for the prosody of *wh*-inherent F

Haida (2007) is primarily concerned with the syntax and semantics of questions. He also offers formulations for the prosodic effect of *wh*-inherent F. His suggestions are cast in terms of variation in the domains of stress-assignment. The constant element is that F attracts the strongest stress in these domains. What varies is the domains. He writes explicitly that he is not attempting to give a general definition of these domains.

For fronted *wh*-phrases, the domain is reduced to the landing site, here Spec,FocP, by assumption. In single-*wh*-questions with a fronted *wh*-word as in (52), there is only the *wh*-word in the relevant domain, and so the stress-requirement is trivially satisfied. For standard complex *wh*-phrases as in (53) (outer brackets), where the *wh*-word does not attract accent or the strongest stress in the domain Spec,FocP, the domain is further reduced to the specifier and head of the *wh*-DP by assumption (inner brackets). Consequently the strongest-stress-assignment inside of it is again trivially satisfied. (The examples are mine, constructed so as to show additional stress-properties of these cases.)

(52) [*Wer*] *hat etwas mitgebracht?*
 who has something brought
 'Who brought something?'

(53) a. [*Welcher*] *Besucher hat seine Schlüssel verloren?*
 which visitor has his keys lost
 'Which visitor has lost his keys?'

b. [*Was für*] *Katzen haben [*was für*] Hunden ihr Futter weggenommen?*
 what for cats have what for dogs their food taken
 'What cats took the food away from what dogs?'

Haida seeks to support the domain approach with yet another class of cases, the more untypical *wh*-phrases in (54).

- (54) a. *was aus Gold*
 what out-of gold
 ‘what out of gold’
- b. *wer aus München*
 who from Munich
 ‘who from Munich’
- c. *welche die schon rot sind*
 which which already red are
 ‘which ones which are already red’

Haida treats these as not participating in the left-edge domain-reduction in *wh*-DPs. Their stress-domain is thus the landing site. He shows contrasts like the one in (55) in support of the domain-approach. According to him, the stress domain that is here the landing site requires, at least for these cases, that the strongest stress in the domain be on the *wh*-word. Thus, Haida reports that (55a) is possible only with an indefinite reading of the *wh*-word, while (55b) has only the question-word reading.

- (55) i. *[was aus Gold] mag sie*
 what out-of gold likes she
 ‘She likes something out of gold.’
- ii. *[was aus Gold] mag sie*
 ‘What out of gold does she like?’

I turn to my comments on Haida’s suggestions. Haida’s larger point in the relevant chapter is to show the consistent presence of *wh*-inherent F. He is trying to show with cases like (55) that one can see its prosodic effects even with fronted *wh*-words. As was seen, I agree with him on his conclusion of the consistent presence of *wh*-inherent F. However, I think we want a prosodic theory with more generality and predictive power for the prosody of these elements. The hypothesis pursued here is that *wh*-inherent F shows no prosodic effect on *wh*-phrases that have undergone *wh*-movement. Let me therefore address Haida’s cases.

For complex *wh*-phrases as in (53) I adopt the standard assumption that the *wh*-feature percolates from the *wh*-word to a higher constituent: the one that can move (see Cable 2010 for review and for an alternative).⁹ I assume that the percolation of *wh* entails the coextensive percolation of *wh*-inherent F. With this, consider the prosody of a *wh*-phrase like $[_{DP} \text{welcher } [_{NP} \text{Besucher}]]_{wh/F}$, ‘which visitor’. STRESS-XP will require accent on the noun: This satisfies STRESS-XP for the NP. (The functional DP does not invoke STRESS-XP by definition.) Where such a *wh*-phrase is in Spec,FocP as in (53a,b), FOCUS and ACCENT-F are satisfied by movement to Spec,FocP. Where a *wh*-phrase occurs in situ as in (53b), ACCENT-F requires it to be accented in the current account. Since it is already accented on the noun due to STRESS-XP (and the accent is inside of the DP with the percolated *wh*/F-feature), no prosodic changes are predicted. This is what we find. (STRESS-XP here hides the effect of ACCENT-F. This, incidentally, is the reason most of the discussion in this paper concentrates on single-word *wh*-phrases, by assumption DPs, which are not affected by STRESS-XP.)

I turn to (54) and (55). I think the temptation to take these as regular structures comes from the fact that their indefinite versions (‘something out of gold’, ‘something that I like’ etc.) seem to be regular structures. The indefinite versions have a straightforward intersective interpretation and can easily be topicalized as in (55a). As expected, they show default stress on the PP as in (55i). I assume that the PP or relative clause is adjoined at the top of the *wh*-word DP: $[_{DP} [_{DP} \text{was}] \text{ aus Gold}]$. I hypothesize that the question-word version is not as regular an expression as the indefinite one, and that the difference comes from difficulties with the percolation of the *wh*/F-feature to the top of the adjoined structure. In support of this, I point out that they are marked in embedded questions as shown in (56).

- (56) ? *Hans fragt sich was aus Gold sie mag.*
 Hans asks himself what out-of gold she likes
 ‘Hans wonders what out of gold she likes.’

Turning to (55b), note that this may be an echo-question judgment with a topicalized constituent in German. Echo-questions do not involve *wh*-movement, so the percolation problems would not arise. Echo questions require sentence stress on the *wh*-word (Reis 1991).¹⁰ This is compatible with (55b) but not with (55a), so the difference can be explained in these terms.

On the whole, I agree with Haida on the consistent presence of *wh*-inherent F. On the other hand, I think there is no compelling evidence in favor of a prosodic account in terms of varying domains or in favor of prosodic effects of *wh*-inherent F after *wh*-movement in a single-*wh*-question.

3.5. A consequence of the findings

I believe that the findings above help us sort among possible analyses of the morphosyntax and semantics of *wh*-inherent F.

What I think the findings show is that there is morphosyntactic interaction between *wh*-inherent F in Spec,FocP and the Q-marker of Baker (1970), most plausibly localized in the head of FocP (or alternatively, interaction of *wh*-inherent F in Spec,FocP and the FocP). It is only if there is a linguistically significant link between *wh*-inherent F in Spec,FocP and Q (or FocP) that we can formulate the stress-conditions right in (46a) and (47a). We need to refer to the presence of this link.

We cannot define the stress-conditions only with respect to the positions of the *wh*-phrases, say, relative to a scope-bearing element like the Q-marker. Here is an attempt: You might say (in a number of ways) that a *wh*-phrase that has scoped out of Q (is in some higher position like Spec,FocP) does not show prosodic F-effects, while a *wh*-phrase inside of the scope of Q does. However, it won't do. It would work for single-*wh*-questions and it would work for the first *wh*-phrase in multiple-*wh*-questions. However, it won't work for the second *wh*-phrase in a multiple-*wh*-question like (25), repeated here as (57).

- (57) *Let's make a plan about how we proceed.*
 Who will inform who about the new program?

Here the *wh*-word in situ shows a prosodic effect of *wh*-inherent F, namely accent. At the same time, we need to say that the initial presence of the first *wh*-phrase exempts the *wh*-inherent F features in the entire structure, including the second *wh*-phrase, from attracting sentence stress. We can only say this if the initial *wh*-phrase enters into a linguistically significant relation with the Q-marker: This relation may exempt all *wh*-inherent F-features that are linked to this Q-marker from attracting sentence stress, as in the account above. If we only refer to the position of the *wh*-phrases, we cannot say that the high position of the first *wh*-phrase exempts the second *wh*-phrase from attracting sentence stress. We can only say that the position of each *wh*-phrase exempts that *wh*-phrase itself from showing prosodic F-effects. But that does not lead to a coherent account.

Thus, it seems that the presence of the first *wh*-phrase in Spec,FocP morphosyntactically enters into a relation with Q (or FocP) and that this relation exempts all *wh*-inherent Fs in the structure from attracting sentence stress.

Among the analyses of *wh*-inherent F that this excludes is in particular a nifty one that might otherwise seem attractive. It is outlined in the following. Question-answer congruence (whether stipulated or derived from discourse coherence) requires that the answer to a question is focused on the answering constituent, as in (58b).

- (58) a. *Who saw Mary?*
 b. *Bill_F saw Mary.*

Now, we normally identify the meaning of a question with the set of its possible answers (Hamblin 1973) or true answers (Karttunen 1977) or elaborated versions thereof (Sharvit 2002). Thus, we take

the meaning of (59a) to be along the lines of (59b). Assume, however, that the requirement of question-answer congruence that we see in (58) would enter into the computation of this set of possible answers. This would mean that the calculation of the question meaning takes into account the information structure of the possible answers. The meaning of (59a) would then not be (59b) but (59c). Due to question-answer congruence, the place of F in (59c) would mimic the place of the *wh*-feature in (59a). This would be an elegant and principled approach to why *wh*-phrases show evidence of the presence of F in them.

- (59) a. *Who_{wh} saw Mary?*
 b. {Bill saw Mary, John saw Mary, ...}
 c. {Bill_F saw Mary, John_F saw Mary, ...}

However, the particular niftiness and elegance of this analysis also brings with it that there would be no morphosyntactic interaction between *wh*-inherent F and the Q-marker of the question. The reason, on this hypothesis, for assigning *wh*-inherent F is only the information structure of the answers, which, by hypothesis, would need to be anticipated in the set of possible answers that constitute the question meaning. I believe, therefore, that we have a strong argument for not pursuing this analysis.

The right analysis, it seems, locates *wh*-inherent F more narrowly in the morphosyntax and semantics of questions, so that not only the *wh*-feature, but also the *wh*-inherent F-feature enters into a morphosyntactic relation with the Q-marker. Of course, this is the perspective typically assumed. It is also supported by the fact of a shared landing site of *wh*-phrases and focused phrases in languages with focus movement. It is inherent, accordingly, in Rizzi's (1997) name FocP as a target for *wh*-movement and focus movement. Still, it may be interesting that we find independent evidence for it in the domain of stress-assignment, and that it allows us to argue against certain theories about the source of *wh*-inherent F.

4. Conclusions

The study of questions in controlled contexts allows us to confirm and solidify two observations from the literature. First, the existential implicature of *wh*-questions does not affect the information structure of the question (Jacobs 1991). Second, a fronted *wh*-word in a single-*wh*-question is unaccented while a *wh*-word in situ in a multiple-*wh*-question requires accent (Haida 2007).

The study of questions in controlled contexts furthermore allowed us to establish two new observations. First, a *wh*-word can be externally assigned information structure F or G in relation to an indefinite pronoun in its context. This sometimes gives rise to the impression of optional F-assignment. Second, destressing of an embedded question requires not only givenness of its parts, but also givenness of the question as a whole.

In the second part of the paper, an account of the prosody of F that generalizes from information structure F to *wh*-inherent F was developed. According to FOCUS, one F attracts the strongest stress in the scope-domain. According to ACCENT-F each F attracts accent. Importantly, an alternative to each of these requirements is movement by the F-marked constituent to Spec,FocP. In *Who gave what to Bill*, movement of *who* to Spec,FocP is an alternative to attraction of sentence stress by FOCUS. The second *wh*-word *what* nevertheless attracts accent by ACCENT-F. The account strengthens analyses with a morphosyntactic connection between *wh*-inherent F in the moved *wh*-phrase and the Q-marker (or FocP).

References

- Baker, C. L. 1970 Notes on the description of English questions: the role of an abstract question-morpheme. *Foundations of Language* 6: 197-219.
- Bresnan, Joan 1971 Sentence stress and syntactic transformations. *Language* 47: 257-281.
- Bresnan, Joan 1972 Stress and syntax: a reply. *Language* 48: 326-342.

- Büring, Daniel 2009 Towards a typology of focus realization. In: Malte Zimmermann and Caroline Féry (eds.), *Information structure*, 177-205. Oxford: Oxford University Press.
- Cable, Seth 2010 *The grammar of Q*. Oxford: Oxford University Press.
- Cheng, Lisa and Laura J. Downing to appear Against FocusP: Arguments from Zulu. In: Ivona Kucerova and Ad Neeleman (eds.), *Information structure: contrasts and positions*, Cambridge: Cambridge University Press.
- Chomsky, Noam and Morris Halle 1968 *The Sound Pattern of English*. New York: Harper and Row.
- Chomsky, Noam 1995 *The minimalist program*. Cambridge, Mass.: MIT Press.
- Dayal, Veneeta 2005 Multiple-*wh*-questions. In: Martin Everaert and Henk van Riemsdijk (eds.), *Syntax companion 3 (Case #44)*, Blackwell.
- Féry, Caroline and Vieri Samek-Lodovici 2006 Focus projection and prosodic prominence in nested foci. *Language* 82: 131-150.
- Féry, Caroline and Frank Kügler 2008 Pitch accent scaling on given, new and focused constituents in German. *Journal of Phonetics* 36: 680-703.
- Féry, Caroline and Shin Ishihara 2009 The phonology of second occurrence focus. *Journal of Linguistics* 45: 285-313.
- Göksel, Asli and Celia Kerslake 2005 *Turkish: a comprehensive grammar*. London: Routledge.
- Gussenhoven, Carlos 1983 *On the grammar and semantics of sentence accents*. Dordrecht: Foris.
- Gussenhoven, Carlos 1992 Sentence accents and argument structure. In: Iggy Roca (ed.), *Thematic structure, its role in grammar*, 79-106. Berlin, New York: Foris.
- Haida, Andreas 2007 The indefiniteness and focusing of *wh*-words. Doctoral dissertation, Humboldt Universität zu Berlin.
- Hamblin, C.L. 1973 Questions in Montague English. *Foundations of Language* 10: 41-53.
- Hamlaoui, Fatima 2011 On the role of phonology and discourse in Francilian French *wh*-questions. *Journal of Linguistics* 47: 129-162.
- Hayes, Bruce and Aditi Lahiri 1991 Bengali intonational phonology. *Natural Language and Linguistic Theory* 9: 47-96.
- Heim, Irene 1991 Artikel und Definitheit. In: Arnim von Stechow and Dieter Wunderlich (eds.), *Semantik, Semantics. Ein internationales Handbuch der zeitgenössischen Forschung*, 487-536. Berlin, New York: Walter de Gruyter.
- Hiraiwa, Ken and Shin Ishihara 2002 Missing links: Cleft, sluicing, and “no da” construction in Japanese. Proceedings of HUMIT 2001, MIT Working Papers in Linguistics, Vol. 43, 35-54. Cambridge, Mass.: MIT Working Papers in Linguistics.
- Hiraiwa, Ken and Shin Ishihara to appear Syntactic metamorphosis: cleft, sluicing, and in-situ focus in Japanese. *Syntax*.

- Höhle, Tilman N. 1992 Über Verum-Fokus im Deutschen. In: Joachim Jacobs (ed.), *Informationsstruktur und Grammatik*, 112-141. Opladen: Westdeutscher Verlag.
- Horvath, Julia 2007 Separating “focus movement” from “focus”. In: Simin Karimi, Vida Samiiian and Wendy K. Wilkins (eds.), *Phrasal and clausal architecture*, 108-145. John Benjamins.
- Ishihara, Shin 2003 Intonation and interface conditions. Doctoral dissertation, Massachusetts Institute of Technology, Cambridge, Mass.
- Ishihara, Shin 2007 Major phrase, focus intonation, multiple spell-out. *The Linguistic Review* 24: 137-167.
- Ishihara, Shinichiro 2002 Invisible but audible *wh*-scope marking: *Wh*-constructions and deaccenting in Japanese. In: Line Mikkelsen and Christopher Potts (eds.), *Proceedings of the 21st West Coast Conference on Formal Linguistics*, 180-193. Somerville, Mass.: Cascadilla Press.
- Jackendoff, Ray S. 1972 *Semantic interpretation in generative grammar*. Cambridge, Mass.: MIT Press.
- Jacobs, Joachim 1991 Implikaturen und “alte Information” in w-Fragen. In: Marga Reis and Inger Rosengren (eds.), *Fragesätze und Fragen*, 201-222. Tübingen: Niemeyer.
- Jacobs, Joachim 1993 Integration. In: Marga Reis (ed.), *Wortstellung und Informationsstruktur*, Tübingen: Niemeyer.
- Jäger, Gerhard 1995 Topic, scrambling, and aktionsart. In: Inga Kohlhof, Susanne Winkler and Hans Bernhard Drubig (eds.), *Proceedings of the Göttingen Focus Workshop. Arbeitspapiere des SFB 340 “Sprachtheoretische Grundlagen für die Computerlinguistik”* Nr. 69-1995, 19-34. Tübingen.
- Kabagema-Bilan, Elena, Beatriz López-Jiménez and Hubert Truckenbrodt 2011 Multiple focus in Mandarin Chinese. *Lingua* 121: 1890-1905.
- Karttunen, Lauri 1977 Syntax and semantics of questions. *Linguistics and Philosophy* 1: 3-44.
- Katz, Jonah and Elisabeth Selkirk in press Contrastive focus vs. discourse-new: evidence from prosodic prominence in English. *Language* 87.
- Kiss, Katalin É. 2002 *The syntax of Hungarian*. Cambridge: Cambridge University Press.
- Kornfilt, Jaklin 1997 *Turkish*. London: Routledge.
- Krifka, Manfred 1991 A compositional semantics for multiple focus constructions. In: Steven Moore and Adam Zachary Wyner (eds.), *Semantics and Linguistic Theory I*, Cornell University Working Papers in Linguistics, 127-158. Ithaca, NY: Cornell University.
- Kubozono, Haruo 1989 Syntactic and rhythmic effects on downstep in Japanese. *Phonology* 6: 39-67.
- Kubozono, Haruo 1993 *The organization of Japanese prosody*. Tokyo: Kurosio Publishers.
- Ladd, D. Robert 1983 Even, focus, and normal stress. *Journal of Semantics* 2: 257-270.
- Pierrehumbert, Janet B. and Mary E. Beckman 1988 *Japanese tone structure*. Cambridge, Mass.: MIT Press.

- Reis, Marga 1991 Echo-w-Sätze und Echo-w-Fragen. In: Marga Reis and Inger Rosengren (eds.), *Fragesätze und Fragen*, 49-76. Tübingen: Niemeyer.
- Rizzi, Luigi 1997 The fine structure of the left periphery. In: Liliane Haegeman (ed.), *Elements of grammar*, 281-337. Dordrecht: Kluwer.
- Rooth, Mats 1992 A theory of focus interpretation. *Natural Language Semantics* 1: 75-116.
- Rooth, Mats 1996 Focus. In: Shalom Lappin (ed.), *The Handbook of Contemporary Semantic Theory*, 271-297. Oxford and Cambridge, Mass.: Blackwell.
- Sabel, Joachim 2006 Typologie des W-Fragesatzes. *Linguistische Berichte* 206: 147-194.
- Samek-Lodovici, Vieri 2005 Prosody-syntax interaction in the expression of focus. *Natural Language and Linguistic Theory* 23: 687-755.
- Sauerland, Uli 2004 Do not interpret focus! Why a presuppositional account of focus fails, and how a presuppositional account of givenness works. In: Emar Maier, Corien Bary and Janneke Huitink (eds.), *Proceedings of Sinn und Bedeutung 9*, 370-384. University of Nijmegen.
- Schwarzschild, Roger 1999 Givenness, AvoidF and other constraints on the placement of accent. *Natural Language Semantics* 7: 141-177.
- Selkirk, Elisabeth 1984 *Phonology and syntax: the relationship between sound and structure*. Cambridge, Mass: MIT Press.
- Selkirk, Elisabeth 1995 Sentence prosody: intonation, stress, and phrasing. In: John Goldsmith (ed.), *The handbook of phonological theory*, 550-569. Cambridge, Mass: Blackwell.
- Selkirk, Elisabeth 2005 Comments on intonational phrasing in English. In: Sónia Frota, Marina Vigário and Maria João Freitas (eds.), *Prosodies. With special reference to Iberian languages*, 11-58. Berlin, New York: Mouton de Gruyter.
- Selkirk, Elisabeth 2008 Contrastive focus, givenness, and the unmarked status of "discourse new". *Acta Linguistica Hungarica* 55: 331-346.
- Sharvit, Yael 2002 Embedded questions and 'de dicto' readings. *Natural Language Semantics* 10: 97-123.
- Stalnaker, Robert 1978 Assertion. In: Peter Cole (ed.), *Syntax and semantics 9: Pragmatics*, New York: Academic Press.
- Stalnaker, Robert 2002 Common ground. *Linguistics and Philosophy* 25: 701-721.
- Takahashi, Daiko 1993 Movement of *wh*-phrases in Japanese. *Natural Language and Linguistic Theory* 11: 655-678.
- Truckenbrodt, Hubert 1995 Phonological phrases: their relation to syntax, focus, and prominence. Doctoral dissertation, Massachusetts Institute of Technology, Cambridge, Mass.
- Truckenbrodt, Hubert 2002 Upstep and embedded register levels. *Phonology* 19: 77-120.
- Truckenbrodt, Hubert 2004 Final lowering in non-final position. *Journal of Phonetics* 32: 313-348.

Truckenbrodt, Hubert 2007 Upstep of edge tones and of nuclear accents. In: Carlos Gussenhoven and Tomas Riad (eds.), *Tones and tunes. Volume 2: Experimental studies in word and sentence prosody*, 349-386. Berlin: Mouton.

Truckenbrodt, Hubert and Isabelle Darcy 2010 Object clauses, movement, and phrasal stress. In: Nomi Shir and Lisa Rochman (eds.), *The sound patterns of syntax*, 189-216. Oxford: Oxford University Press.

Truckenbrodt, Hubert in press Effects of indefinite pronouns and traces on verb stress in German. In: Toni J. Borowsky, Shigeto Kawahara and Takahito Shinya (eds.), *Prosody Matters: Essays in Honor of Lisa Selkirk*, London: Equinox Publishing.

Truckenbrodt, Hubert to appear Q-related F. *Lingua*.

Uhmann, Susanne 1991 *Fokusphonologie. Eine Analyse deutscher Intonationskonturen im Rahmen der nicht-linearen Phonologie*. Tübingen: Niemeyer.

van Deemter, Kees 1994 What's New? A semantic perspective on sentence accent. *Journal of Semantics* 11: 1-31.

Wagner, Michael in press Focus and givenness: a unified approach. In: Ivona Kucerova and Ad Neeleman (eds.), *Information structure. Contrasts and positions*, Cambridge: Cambridge University Press.

Wagner, Michael 2005 Prosody and recursion. Doctoral dissertation, Massachusetts Institute of Technology, Cambridge, Mass.

Xu, Yi 1999 Effects of tone and focus on the formation and alignment of f0 contours. *Journal of Phonetics* 27: 55-105.

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¹ The constraint, originally from Truckenbrodt (1995), is applied to German briefly in Samek-Lodovici (2005) and in Truckenbrodt (2006, 2007), and to a range of other languages in Truckenbrodt (1995), Samek-Lodovici (2005) and Féry and Samek-Lodovici (2006). More detailed applications to German can be found in Truckenbrodt and Darcy (2010) (interaction with syntactic movement) and in Truckenbrodt (in press) (different objects and indefinite pronouns).

² See Gussenhoven (1983), Hayes and Lahiri (1991), Selkirk (2005, 1995), and, for German, Uhmann (1991) and the work on German cited in the preceding footnote. *NSR* in the name is a reference to the related *Nuclear Stress Rule* of Chomsky and Halle (1968).

³ The VP is drawn to contain both objects, though a VP-shell structure would lead to the same result in the case at hand. See Truckenbrodt (in press) for application of STRESS-XP in VP-shell structures.

⁴ Ladd (1983), Selkirk (1995), and Schwarzschild (1999) argued for prosodic effects of givenness. Féry and Samek-Lodovici (2006) postulated a feature G independent of F with a destressing prosodic effect.

⁵ For the semantic interpretation, I assume that givenness, like the presuppositions of focus, is evaluated relative to the common ground in a particular way. See Stalnaker (1978, 2002) on the evaluation of (unfiltered) presuppositions relative to the common ground. We can adopt the notion of *presupposed salience* from Wagner (in press) for our understanding of givenness: Participants in the

conversation know that the intension of a constituent is salient. An example is the intension of *unicorn* in (i) but not in (ii). Its presupposed salience is different from its presupposed existence.

(i) A to B: *There are no unicorns.* B to A: *Last night I dreamt of a unicorn.*

(ii) A to himself, inaudible to B: *There are no unicorns.* A to B: *Last night I dreamt of a unicorn.*

Thus, if you think of the common ground as a set of propositions, the common ground after the first utterance in (i) will not include the proposition that unicorns exist, but it will include the proposition that A and B know that the meaning of *a unicorn* is salient to both. It is the latter that satisfies the description of givenness in the common ground, as I use this term. In (ii), such salience of the meaning in the common ground is not present after A's remark that is inaudible to B. Here *a unicorn* is not given in the common ground and thus not destressed.

⁶ I replace Bresnan's verb *written* with *edited*, to be sure to have a verb that is not predictable in the context. Notice that some inferential path from the context to the verb must be present *regardless of the issue of the givenness of the verb*, for the existential implicature of the *wh*-question to make sense. In (18) the existential implicature is Hans' assumption that she edited something/books, and the inferential path is from academic occupation to editing. This is parallel to the inferential path from invitation to bringing something in (16) and (17). As we saw in (16) and (17), the inferential path that licenses the existential implicature can be separated from the issue of the givenness of the verb.

⁷ The first *wh*-word in a multiple-*wh*-question, can, I think, still be unaccented, but seems to show a tendency for co-accenting with the *wh*-word in situ. This may be optional if the two are in the same clause. It may also depend on different readings of the multiple-*wh*-question (single-answer vs. pair-list). Experimental work beyond the scope of this paper is required here. I leave the issue open and develop an analysis that allows the first *wh*-word to remain unaccented.

⁸ Japanese *wh*-phrases can scramble. Takahashi (1993) postulates that some instances of dislocation involve *wh*-movement to Spec,CP in Japanese. Ishihara (2002) shows that Takahashi's data can also be explained in terms of a scrambling analysis of *wh*-phrases, rather than *wh*-movement. The dislocated *wh*-phrases at issue also show focus prosody. They are compatible with the current account under Ishihara's analysis, i.e. if there is no *wh*-movement in Japanese.

⁹ I do not assume that there is focus feature percolation with information structure focus. I assume instead that certain ways of placing F in a syntactic structure (for examples F on VP or F on a regular preverbal object) happen to result in assignment of sentence stress to the same word (in our example, to the object noun), given STRESS-XP and NSR-I. See Horvath (2007) on differences between *wh*-feature percolation and assumed focus feature percolation.

¹⁰ This sentence stress would be predicted by the presence of *wh*-inherent F in the absence of *wh*-movement in the current account. The issue is not pursued here, since it is hard to separate it from what appears to be a givenness-requirement on the non-*wh*-part of echo questions.