

The Information Structure of Discontinuous NPs in German

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1 Introduction

This paper investigates a particular word order phenomenon in German, the occurrence of discontinuous NPs which we will refer to as the NP-PP split construction in order to research the division of labor between the syntactic analysis and discourse constraints on this construction. We will argue that some of the factors which previous literature has tried to explain in terms of syntactic restrictions are in fact derivable from discourse factors.

The NP-PP split construction, in which a PP occurs separate from its nominal head, is exemplified in (1).

- (1) a. *Über Syntax* hat Max sich [ein Buch] ausgeliehen.
about syntax has Max self a book borrowed
'Max borrowed a book on syntax.'
- b. [Ein Buch] hat Max sich *über Syntax* ausgeliehen.
a book has Max self about syntax borrowed

In (1a), the PP *über Syntax* has been fronted while the embedding NP *ein Buch* remains in the *Mittelfeld*. (1b) shows the reverse case where the NP is fronted while the PP remains in the *Mittelfeld*.

It has often been observed that grammatical examples of NP-PP split become ungrammatical when the embedding verb is replaced by a verb which has the same syntactic properties but a different semantics (cf., Grewendorf 1989, Pafel 1995).

- (2) * *Über Syntax* hat Max [ein Buch] geklaut.
on syntax has Max a book stolen
'Max stole a book on syntax.'

The only difference between the grammatical NP-PP split construction in (1a) and the ungrammatical one shown in (2) is that the verb *ausleihen* (to borrow) is replaced by the verb *klauen* (to steal).

Interestingly, given an appropriate context a sentence like (2) becomes much more acceptable as illustrated by (3).

(3) Gestern wurde in der Bibliothek eine Anzahl von Linguistikbüchern geklaut. Vor allem Semantikbücher verschwanden dabei.

‘Yesterday, a number of linguistics books were stolen from the library. Mostly books on semantic disappeared.’

- a. *Über Syntax* wurde aber [nur ein Buch] geklaut.
on syntax was but only one book stolen
‘There was, however, only one book on syntax stolen.’

And (1b) can also become much less acceptable in a certain context as shown in (4).

(4) Gestern war Klaus seit langem mal wieder in der Bibliothek. ‘Yesterday, Klaus went to the library.’

- a. # [Ein Buch] wollte er dort *über Syntax* ausleihen.
a book wanted he there on syntax borrow
‘He wanted to borrow a book on syntax there.’

To find an explanation for these context effects, we will take a closer look at the possible focus-background structures of the construction. We will observe that separating a PP from an NP is only acceptable if not both the NP and the PP are part of the same focus projection or the background of a sentence. To account for these pragmatic restrictions on NP-PP split constructions, we will develop an information structure component for HPSG in which the focus-background structure of signs can be represented. This enables us to formulate a principle which restricts the occurrence of NP-PP split constructions to adequate focus-background structures.

2 Information structure of NP-PP split

In this section we investigate the nature of the context effects in connection with the NP-PP split construction. It is generally acknowledged that sentences carry, besides their meaning which can be described via truth-conditional semantics, a meaning which depends on the context in which a sentence is uttered. This type of meaning has been studied under the name *information structure* in the area of pragmatics.

The information structure of a sentence divides an utterance into the part which is informative with respect to a certain discourse (i.e., what is often called the focus), and in the part which is uninformative (i.e., what we will refer to as the background). Languages differ with respect to how the information structure of utterances is represented. German is, like English and French, a so-called intonation language and focused constituents are signaled by pitch accents (cf., Féry 1993).

As the possible information structure of a sentence seems to be the key to determine whether a given sentence is a felicitous utterance in a given context or not, we investigated the possible focus-background structures of the NP-PP split constructions. To do this, we tested sentences with a split PP and NP with different pitch accents in the context of question answer pairs. We

investigated i) fronted PPs with an accent on the partial NP or ii) an accent on the PP, iii) fronted partial NPs with an accent on the partial NP or iv) an accent on the PP. The result was that the split NP and PP cannot both be part of the same focus projection or the background of a sentence. To illustrate this finding let us take a closer look at some of the accent placements and NP-PP orders we tested (the entire range of data we investigated is discussed in De Kuthy (2000)).

2.1 Fronted PPs and an accent on the NP

Let us first consider those cases where the NP remaining in the *Mittelfeld* bears the focus accent and no other word in the examples has a pitch accent.

(5) shows the focus-background structures that are possible if the focus accent is on *Buch*, while the PP dependent of the respective NP *über Syntax* occurs at the beginning of the sentence.¹

- (5) a. Was hat Max über Mozart ausgeliehen?

‘What did Max borrow on syntax?’

Über Mozart hat Max [ein BUCH\]_F ausgeliehen.
about Mozart has Max a book borrowed

- b. Was hat Max ausgeliehen?

‘What did Max borrow?’

[Über Mozart]_F hat Max [ein BUCH\]_F ausgeliehen.
about Mozart has Max a book borrowed

- c. Was ist geschehen?

‘What happened’

[Über Mozart hat Max ein BUCH\ ausgeliehen.]_F
about Mozart has Max a book borrowed

Apparently, the only possibility is narrow focus on *ein Buch* as in (5a). Broad focus on the entire NP including the PP in the fronted position (5b) or over the entire sentence (5c) is not possible.

What is possible, though, is a multiple-focus structure with an additional accent on the fronted PP as shown in (6a).

- (6) a. Über welchen Komponisten hat Max was ausgeliehen? ‘About which composer did Max borrow what?’

[Über MOZART/]_F hat Max [ein BUCH\]_F ausgeliehen.
about Mozart has Max a book borrowed

- b. Was hat Max über berühmte Komponisten ausgeliehen? ‘What did Max borrow about famous composers?’

¹As usual, pitch accent placement is noted by capital letters and the entire focus domain is marked by the brackets [_F]. The rising contour of an accent is marked by ’/’, the falling contour by ’\’.

[Über MOZART/]T hat Max [ein BUCH\]F ausgeliehen.
 about Mozart has Max a book borrowed

The same accent pattern can also be used as indicating a so-called i-topicalization, as illustrated by the question-answer pair in (6b). Here, accent on the fronted PP serves as a topic accent, and not as another focus accent as in (6a).

2.2 Fronted PPs and an accent on the PP

In (7), the effect of a single pitch accent on the fronted constituent, the PP *über Mozart*, is illustrated.

- (7) a. Worüber hat Max ein Buch ausgeliehen?
 ‘About what did Max borrow a book?’

[Über MOZART\]F hat Max ein Buch ausgeliehen.
 about Mozart has Max a book borrowed

- b. Was hat Max ausgeliehen?
 ‘What did Max borrow?’

[Über MOZART\]F hat Max [ein Buch]F ausgeliehen.
 about Mozart has Max a book borrowed

- c. Was hat Max getan?
 ‘What did Max do?’

[Über MOZART\]F hat Max [ein Buch ausgeliehen.]F
 about Mozart has Max a book borrowed

Similar to the examples in (5), only narrow focus on the constituent bearing the accent, here the fronted PP, is possible.

2.3 No accent on the PP or the NP

Next, it is interesting to see what happens if the focus accent is neither on the PP nor on the NP, but for example on the subject NP *Max* as in (8).

- (8) Wer hat ein Buch über Mozart ausgeliehen?
 ‘Who borrowed a book on Mozart?’

Über Mozart hat [MAX\]F ein Buch ausgeliehen.
 on Mozart has Max a book borrowed

The narrow focus on the subject, which means that the PP and the NP are both in the background does not result in a felicitous utterance.

2.4 Fronted NPs – accent on the PP

Let us now consider those cases where the PP remaining in the *Mittelfeld* bears the focus accent and no other word in the examples has a pitch accent.

- (9) a. Worüber hat Max ein Buch ausgeliehen?

‘about what did Max borrow a book?’

Ein Buch hat Max [über MOZART\]_F ausgeliehen.

a book has Max on Mozart borrowed

- b. Was hat Max ausgeliehen?

‘What did Max borrow?’

[Ein Buch]_F hat Max [über MOZART\]_F ausgeliehen.

a book has Max on Mozart borrowed

- c. Was hat Max getan?

‘What did Max do?’

[Ein Buch]_F hat Max [über MOZART\ ausgeliehen.]_F

a book has Max on Mozart borrowed

The pattern is the same as for a focused partial NP remaining in the *Mittelfeld* we saw in (5). Only the accented PP can be in the focus as shown by the question-answer pair in (9a), while including the fronted NP into the focus projection or the entire VP with the verb *ausgeliehen* results in infelicitous utterances as shown in (9b) and (9c).

What is again possible is a rising accent on the fronted NP *ein Buch* as exemplified by the question-answer pairs in (10).

- (10) a. Was hat Max über welchen Komponisten ausgeliehen?

‘About which composer did Max borrow what?’

[Ein BUCH/]_F hat Max [über MOZART\]_F ausgeliehen.

a book has Max about Mozart borrowed

- b. Über welchen Komponisten hat Max Material ausgeliehen?

‘Material about which composer did Max borrow?’

[Ein BUCH/]_T hat Max [über MOZART\]_F ausgeliehen.

a book has Max about Mozart borrowed

The resulting utterances can either occur with a multiple focus structure as in (10a) or as an i-topicalization as in (10b).

2.5 Fronted NPs – accent on the NP

If the fronted NP is focussed the focus can again not project as illustrated in (11).

(11) a. Was hat Max über Mozart ausgeliehen?

‘What did Max borrow about Mozart?’

[Ein BUCH\]_F hat Max über Mozart ausgeliehen.

a book has Max about Mozart borrowed

b. Was hat Max ausgeliehen?

‘What did Max borrow?’

[Ein BUCH\]_F hat Max [über Mozart]_F ausgeliehen.

a book has Max about Mozart borrowed

c. Was hat Max getan?

‘What did Max do?’

[Ein BUCH\]_F hat Max [über Mozart ausgeliehen.]_F

a book has Max about Mozart borrowed

Looking at the pattern that all the above examples have in common, one can observe the following: the split NP and PP cannot both be part of the same focus. And the two elements cannot both be part of the background.

3 The Specificity Effect

Müller (1996) and others claim that the NP-PP split construction exhibit the specificity effect, a classical restriction on extraction (cf., Fiengo and Higginbotham, 1981).

(12) a. * *Über Syntax* hat Karl [**das** Buch] gelesen.

on syntax has Karl the book read

‘Karl read the book on syntax.’

b. ?? [**Das** Buch] hat Karl *über Syntax* gelesen.

the book has Karl on syntax read

But, as Pafel (1993) observed, the specificity of an NP in German does not generally disallow fronting of the embedded PP as illustrated by the examples in (13) so that a syntactic specificity effect cannot account for the ungrammaticality of the examples in (12).

(13) a. *Über Syntax* hat Karl nur **dieses**, aber nicht **jenes** Buch gelesen.

on syntax has Karl only this but not that book read

‘Karl only read this book on syntax and not that one.’

- b. [Nur dieses Buch] hat Karl *über Syntax* gelesen.
 Only this book has Karl on syntax read
 ‘Karl only read this book on syntax.’

To find an alternative explanation for the contrast between the examples in (12) and (13), we took a closer look at these examples under the perspective of the possible focus-background structures of these examples. We will see that the contrast can be explained quite straightforwardly with the help of our observations from the previous section.

3.1 The pragmatics of definite determiners

As a starting point, let us take a closer look at the notion of definiteness which seems to play a role in the examples under discussion because the NPs involved all have a definite determiner.

Definite NPs are often used to refer to entities already present in the discourse, as for example the NP *das Buch über Syntax* in (14a).

- (14) Gestern habe ich ein interessantes Buch über Syntax bei Osiander gesehen.
 ‘Yesterday, I saw an interesting book on syntax at Osiander.’

- a. Ich habe mir [das Buch über Syntax] heute gekauft.
 I have me the book on syntax today bought
 ‘Today, I bought this book on syntax.’
- b. * *Über Syntax* habe ich mir [das Buch] heute gekauft.
 on syntax have I me the book today bought

After what we said about admissible focus-background structures for the NP-PP split construction, the ungrammaticality of (14b) is expected, since the entire definite NP including the embedded PP is in the background of the sentence.

Definite NPs, however, can also be used in discourses where they do not refer to an entity already present in the discourse as illustrated in (15).

- (15) What did you buy at Osiander?

Ich habe mir [das Buch über Syntax] gekauft, das Du mir letztlich empfohlen hast.
 I have me the book on syntax bought which you me recently recommended have
 ‘I bought the book on syntax that you recommended to me very recently.’

In such cases, the definite NP can be in the focus while the PP is in the background. And, just as expected under the information structure constraints on the NP-PP split construction we mentioned above, with such a definite NP in the focus, the NP-PP split is possible, as shown in (16).

- (16) What did you borrow on syntax?

Über Syntax habe ich mir [das Buch, das Du mir letztlich empfohlen hast,]
 on syntax have I me the book which you to me recently recommended has
 ausgeliehen.
 borrowed

‘On Syntax I borrowed the book that you recommended to me very recently.’

The supposed syntactic Specificity Effect can thus be reduced to an empirically more adequate information structure constraint.

4 A theory of information structure

We now want to integrate the insights of the empirical discussion of the focus-background structures of sentences into an HPSG account of the NP-PP split construction. We develop an approach to information structure in HPSG building on the proposal of Engdahl and Vallduvì (1994) in which a focus-background structure for every sentence is build up compositionally from the focus-background structures of its subparts. In the approach by Engdahl and Vallduvì (1994) the information structure is represented as part of the `CONTEXT` of signs with the help of an additional feature `INFO-STRUC`, as shown in figure 1.

$$\left[\begin{array}{l} \textit{sign} \\ \text{SYNSEM|LOCAL|CONTEXT|INFO-STRUC} \end{array} \left[\begin{array}{l} \text{FOCUS} \quad \textit{sign} \\ \text{GROUND} \quad \left[\begin{array}{l} \text{LINK} \quad \textit{sign} \\ \text{TAIL} \quad \textit{sign} \end{array} \right] \end{array} \right] \right]$$

Figure 1: The `INFO-STRUC` of Engdahl and Vallduvì (1994)

For our own approach we reconsidered the location of information structure in signs and the appropriate values of `FOCUS` and `GROUND` before proceeding to formulate principles determining the distribution of the `INFO-STRUC` values in the tree.

4.1 Location of information structure in signs

Assuming that the information structure is part of *local* objects (which it is if it is part of the `CONTEXT` in HPSG as proposed by Engdahl and Vallduvì (1994)) is problematic in connection with a trace-based account of unbounded dependencies. Traces should not contribute anything to the information structure of a sentence. As we would like to develop an information structure approach which is independent of the decision of which kind of UDC theory one assumes, the only options for placing the information structure attribute are *synsem* objects or signs.

Information structure as part of *synsem* objects would suggest that it plays a role in syntactic selection. As we are not aware of any phenomenon supporting this, we conclude that information structure should be represented as appropriate for signs.

4.2 The values of focus, topic and background

We will assume a tripartite partition of information structure into focus, topic, and background. As to the question what kinds of objects should be defined as the values of these features, we pro-

pose the values of the INFO-STRUC features to be chunks of semantic information. The semantic representation proposed in Pollard and Sag (1994) is not appropriate for our purpose, because the semantic composition is not done in parallel with the syntactic build-up of a phrase. We therefore adopt the Montague-style semantic representation for HPSG proposed in Sailer (2000), in which CONTENT values are regarded as representations of a symbolic language with a model-theoretic interpretation. As the semantic object language under CONTENT the language Ty2 (cf., Gallin 1975) of two-sorted type theory is chosen. The logical form of a sentence is an HPSG representation of an expression of Ty2. Ty2 expressions are defined as objects in the denotation of a sort *meaningful-expression* (*me*).² As an example, figure 2 shows the logical form of a simple declarative sentence as the value of LOGICAL-FORM (LF) which is appropriate to *content*. The logical forms at phrase nodes are derived via functional composition and β -reduction from the logical forms at the daughter nodes.

In our information structure representation the focus and the topic of a word or a phrase are each represented by a *meaningful-expression*. If an entire word or phrase is in the focus, then the FOCUS value corresponds to the LF value of that entire sign. If only parts of a phrase are in the focus, then the FOCUS value of that phrase correspond to the LF value of that part of the phrase which is in the focus. We need, however, to distinguish those cases, where there is only one focus accent in a sentence from those where is more than one focus accent and, possibly, more than one domain of focus projection. We will therefore assume that each of these focus domains is represented by a *meaningful-expression* and the value of the FOCUS attribute in our theory is therefore a list of *mes*. The same holds for the TOPIC value.

The background of a sentence in our approach is defined to be that part of the logical form of the sentence which is neither in focus nor in topic. This characterization of background closely resembles the definition of background employed by the so-called *structured meaning* approaches to focus of von Stechow (1981); Jacobs (1983) or Krifka (1992). In such an approach, the background of a sentence can be derived from the representation of focus by independent means. We thus do not need to explicitly represent background in our representation of information structure. The INFO-STRUC value of a simple sentence with the focus as indicated in (17) is thus structured as shown in figure 2.

- (17) Peter [liest ein BUCH.]_F
 Peter reads a book

$$\left[\begin{array}{ll} \text{PHON} & \langle \textit{Peter,liest,ein,Buch} \rangle \\ \text{S|LOC|CONT|LF} & \exists x[\textit{book}'(x) \wedge \textit{read}'(p, x)] \\ \text{INFO-STRUC} & \left[\begin{array}{l} \text{FOCUS} \quad \langle \lambda y \exists x[\textit{book}'(x) \wedge \textit{read}'(y, x)] \rangle \\ \text{TOPIC} \quad \langle \rangle \end{array} \right] \end{array} \right]$$

Figure 2: The values of focus and background

²The reader interested in the formal properties of this semantic representation is referred to Richter (2000, chapter 5.4).

4.3 Information structure principles

As mentioned above, German is an intonation language, i.e., different parts of focus-background structure are marked by different accents. To encode whether a word bears an accent and if so, what kind of accent, we enrich the phonology of signs with the feature ACCENT as shown in figure 3.

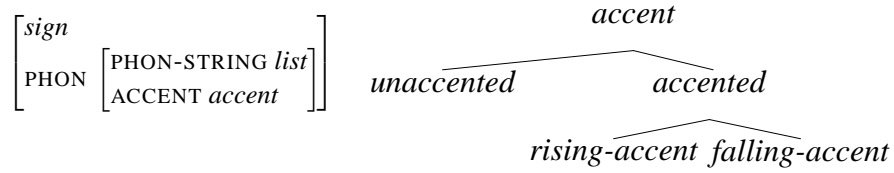


Figure 3: The phonology of signs

We can now turn to formulating the lexical principle in figure (4) which captures the fact that a pitch accent on a word with a falling contour signals focus and an accent with a rising contour can either signal focus or topic. As mentioned above, the fact that a word is focused in our theory is

$$\begin{aligned}
 \text{word} \rightarrow & \left[\begin{array}{l} \text{PHON|ACCENT } unaccented \\ \text{INFO-STRUC } \left[\begin{array}{l} \text{FOCUS } \langle \rangle \\ \text{TOPIC } \langle \rangle \end{array} \right] \end{array} \right] \vee \left[\begin{array}{l} \text{PHON|ACCENT } falling-accent \\ \text{SS|LOC|CONT|LF } \boxed{1} \\ \text{INFO-STRUC } \left[\begin{array}{l} \text{FOCUS } \langle \boxed{1} \rangle \\ \text{TOPIC } \langle \rangle \end{array} \right] \end{array} \right] \\
 & \vee \left[\begin{array}{l} \text{PHON|ACCENT } rising-accent \\ \text{SS|LOC|CONT|LF } \boxed{1} \\ \text{INFO-STRUC } \left[\begin{array}{l} \text{FOCUS } \langle \rangle \\ \text{TOPIC } \langle \boxed{1} \rangle \end{array} \right] \end{array} \right] \vee \left[\begin{array}{l} \text{PHON|ACCENT } rising-accent \\ \text{SS|LOC|CONT|LF } \boxed{1} \\ \text{INFO-STRUC } \left[\begin{array}{l} \text{FOCUS } \langle \boxed{1} \rangle \\ \text{TOPIC } \langle \rangle \end{array} \right] \end{array} \right]
 \end{aligned}$$

Figure 4: Info-struct values of words

represented by the fact that it identifies its logical form with its FOCUS value. And if it is in the topic, it identifies its logical form with its TOPIC value. An unaccented word has empty FOCUS and TOPIC lists.

Next, we need to determine the information-structure values of phrases. The simplest case are those sentences where the focus or the topic does not project, i.e., only the words bearing an accent are in the topic or in the focus of an utterance. In this case, the mother of a phrase just collects

$$\text{phrase} \rightarrow \left[\begin{array}{l} \text{INFO-STRUC|FOCUS } \boxed{1} \oplus \boxed{2} \\ \text{DTRS } \left[\begin{array}{l} \text{HEAD-DTRS|INFO-STRUC|FOCUS } \boxed{1} \\ \text{NHEAD-DTRS } collect-focus(\boxed{2}) \end{array} \right] \end{array} \right]$$

Figure 5: The base case of focus projection

the focus values of all her daughters as ensured by the principle in figure 5³. This principle

³Definition of the relation *collect-focus*:
 $collect-focus(\langle \rangle) := \langle \rangle$.
 $collect-focus(\langle \boxed{1} \boxed{2} \rangle) := \langle [INFO-STRUC|FOCUS \langle \boxed{1} \rangle] | collect-focus(\boxed{2}) \rangle$.

also covers those cases where one of the daughters is part of a focus domain but the focus is not projected further up. A similar principle is needed to determine the TOPIC value of phrases.

4.4 Focus projection

There have been many attempts to formulate rules for focus projection in German, cf, e.g., Jacobs (1988, 1991), von Stechow and Uhmman (1986), and Uhmman (1991). Fortunately, the focus projection within NPs and PPs we are primarily interested in is much simpler than the highly complex interaction of factors interacting for focus projection in the VP. It is sufficient to express that the entire NP (or PP) can be focused if the rightmost constituent in that NP (or PP) is focused. The principle in figure 6 shows a formulation of this constraint as part of our theory. If focus projection

$$\begin{array}{l}
 \text{phrase} \rightarrow \left[\begin{array}{l} \text{INFO-STR|FOCUS } \boxed{1} \oplus \boxed{2} \\ \text{DTRS} \left[\begin{array}{l} \text{HEAD-DTR|INFO-STR|FOCUS } \boxed{1} \\ \text{NHEAD-DTRS } \textit{collect-focus}(\boxed{2}) \end{array} \right] \end{array} \right] \\
 \vee \left[\begin{array}{l} \text{PHON } \boxed{1} \oplus \boxed{2} \\ \text{SS|LOC} \left[\begin{array}{l} \text{CAT|HEAD } \textit{noun} \vee \textit{prep} \\ \text{CONT|LF } \boxed{3} \end{array} \right] \\ \text{INFO-STR|FOCUS } \langle \boxed{3} \rangle \\ \text{DTRS} \left(\begin{array}{l} \left[\begin{array}{l} \text{H-DTR} \left[\begin{array}{l} \text{PHON} \quad \quad \quad \boxed{2} \\ \text{SS|L|CONT} \quad \quad \quad \boxed{4} \\ \text{INFO-STR|FOCUS} \quad \langle \boxed{4} \rangle \end{array} \right] \\ \vee \\ \left[\begin{array}{l} \text{N-DTRS} \langle \dots, \left[\begin{array}{l} \text{PHON} \quad \quad \quad \boxed{2} \\ \text{SS|L|CONT} \quad \quad \quad \boxed{4} \\ \text{INFO-STR|FOCUS} \quad \langle \boxed{4} \rangle \end{array} \right] \dots \rangle \end{array} \right] \end{array} \right) \end{array} \right]
 \end{array}
 \end{array}$$

Figure 6: Focus projection in NPs

is possible in a certain configuration then this is always optional, therefore the focus projection principle for nouns and prepositions is formulated as a disjunct of our general principle for narrow focus in phrases in figure 5. The second disjunct of the new principle in figure 6 ensures that a phrase headed by a noun or a preposition can only be in the focus (i.e., its entire logical form is token identical to its focus value) if the daughter that contributes the rightmost part of the phonology of the phrase is entirely focused itself. Again, a similar principle needs to be provided for the TOPIC value of nominal and prepositional phrases.

4.5 An example

Now that we have introduced some basic principles for a theory of information structure in HPSG, let us take a look at the focus-background structure of an NP-PP split construction.

The tree in figure 7 shows the structure of example (6a) we saw on p. 3 as licensed by our theory.⁴

⁴We here are not concerned with the syntactic licensing of NP-PP split constructions. A syntactic account of the construction has been provided by De Kuthy (2001, 2000) and we can just base our analysis on that proposal.

The sentence has two focused constituents, *ein Buch* and *über Syntax*, as the question in (6a)

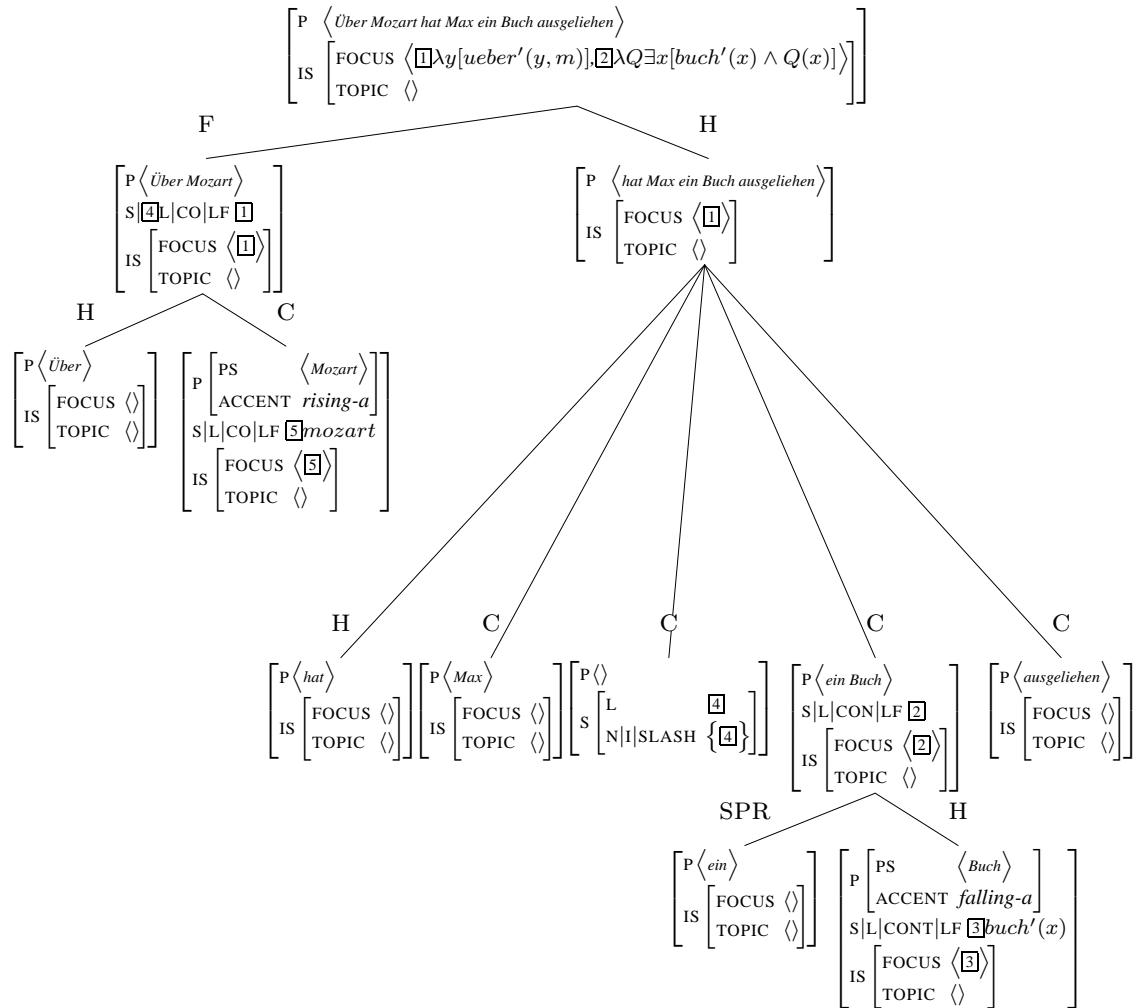


Figure 7: A multiple focus structure

indicates, and respectively two focus accents, one on *Syntax* in the fronted PP and one on *Buch* in the NP left behind. According to our information-structure principle of words in figure 4, both words contribute their LOGICAL-FORM value to their FOCUS. The principle of figure 6 licenses the focus values both of the NP and the PP, such that they contribute their own LF values to their FOCUS values. In the flat head-complement phrase dominating the NP *ein Buch* no other constituent is focused and it is thus only the FOCUS value of the PP that occurs on the FOCUS list of the governing verb phrase. In the head-filler phrase, the focus values of both daughters are collected and the entire sentence thus has an information structure with two elements on its FOCUS list, the FOCUS values of the focused NP and the focused PP.

4.6 A context principle

In section 2 we established that a sentence containing an NP-PP split construction is only a felicitous utterance if the NP and the PP are not part of the same informational partitions. How can our HPSG theory now rule out sentences like (5b) and (5c) where the NP and the PP are both part of the focus? We did not provide principles for focus projection in verb phrases, but a complete theory of focus projection would license the focus projection in cases like (5b) and (5c). On the basis of such a representation, a principle like the following would thus be needed to license NP-PP split constructions only with the desired focus-background structures.

In an utterance, in which a PP occurs separate from an NP, either the PP or the NP must be in the focus or in the topic of the utterance, but they cannot both be part of the topic or the same focus projection.

The last restriction can be formalized as: they cannot be part of the same *meaningful-expression* on the FOCUS list or the TOPIC list of the info-struct value of the utterance.

Future work should examine whether such an idiosyncratic and construction specific principle could be generalized to occurrences of partial constituents in general.

5 The role of lexical restrictions

Under the approach pursued here, the two sentences in (1a) and (2) which we saw at the very beginning of this paper are both well-formed utterances if they occur in the appropriate context, i.e., their information structure values obey certain restrictions. How could one then capture the difference in acceptability between the two sentences in (1a) and (2) which nevertheless exists? The lexical effects mainly show up with out-of-the-blue utterances, which are much improved by providing an appropriate context. We would like to argue that depending on the lexical material of a sentence the appropriate focus-background structure of an acceptable NP-PP split construction is more or less easy to imagine. More research is needed to investigate the status of such extra-grammatical factors as an explanation for such lexical effects.

6 Summary

We investigated the contextual factors that influence the grammaticality of the NP-PP split construction. We observed that separating a PP from an NP is only acceptable if not both the NP and the PP are part of the same focus projection or the background of a sentence. We showed that some of the supposed syntactic restrictions on the construction, such as the Specificity Effect, can straightforwardly be explained as falling out of the discourse restrictions for this construction. To integrate these observations into our HPSG account, we developed an information structure component in which the focus-background structure of signs can be represented.

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