The Linkhood Constraint thus has two purposes: it ensures clitic doubling and it connects the particular word order of left dislocated phrase to discourse properties by requiring the filler daughter to be the link of the entire clause.

Other approaches dealing with left dislocated phrases are the ones by De Kuthy (2002) and De Kuthy & Meurers (2003); the latter relates the occurrence of discontinuous NPs in German to specific information structural contexts, while De Kuthy & Meurers (2003) show that the realization of subjects as part of fronted non-finite constituents and its constraints can be accounted for based on independent information structure conditions.

Based on the setup discussed in Section 3.2.2 above, constraints are formulated that restrict the occurrence of discontinuous NPs and fronted VPs based on their information structure properties. The type of discontinuous NPs at the center of De Kuthy's approach are so-called NP-PP split constructions, in which a PP occurs separate from its nominal head, as exemplified in (32).

(32) 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

The information structure properties of discontinuous noun phrases are summarized in De Kuthy (2002: 176) in the following principle:

> 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. (De Kuthy 2002: 176)

The last restriction can be formalized as: the PP's or NP's CONTENT values cannot be part of the same meaningful-expression on the FOCUS list or the TOPIC list of the INFO-STRUC value of the utterance.

As discussed in De Kuthy & Meurers (2003), it has been observed that in German it is possible for unergative and unaccusative verbs to realize a subject as part of a fronted non-finite verbal constituent (Haider 1990). This is exemplified in (33) with examples from Haider (1990: 94):

(33) a. [Ein Fehler unterlaufen] ist meinem Lehrer noch nie.
an.NOM error crept.in is my.DAT teacher still never
'So far my teacher has never made a mistake.'

b. [Haare wachsen] können ihm nicht mehr.
hair.NOM grow can him.DAT not anymore
'His hair cannot grow anymore.'

c. [Ein Außenseiter gewonnen] hat hier noch nie.
an.NOM outsider won has hier still never
'An outsider has never won here yet.'

In order to account for the context-sensitive occurrence of such fronted verbal constituents, specific information structure properties of fronted verb phrases need to be expressed in a principle expressing what De Kuthy & Meurers refer to as Webelhuth's generalization (Webelhuth 1990: 53): In an utterance in which a verb phrase occurs as a fronted constituent (i.e., the filler of a head-filler phrase) this entire verb phrase must be in the focus of the utterance (i.e., the FOCUS value of the fronted constituent must be identical to its semantic representation). The formalization of this principle provided by (De Kuthy & Meurers 2003) is shown in (34).

(34) Webelhuth's generalization (De Kuthy & Meurers 2003):

$$\begin{bmatrix} \textit{head-filler-phrase} \\ \text{NON-HEAD-DTR|SYNSEM|LOC|CAT|HEAD} \;\; \textit{verb} \end{bmatrix} \rightarrow \begin{bmatrix} \text{INFO-STRUC|FOCUS} \left\langle \boxed{1} \right\rangle \\ \text{NON-HEAD-DTR} \begin{bmatrix} \text{INFO-STRUC|FOCUS} & \left\langle \boxed{1} \right\rangle \\ \text{SYNSEM|LOC|CONT|LF} & \boxed{1} \end{bmatrix} \end{bmatrix}$$

Combining the new lexical specifications, the focus projection rule for the verbal domain and the partial fronting focus requirement with the basic setup of De Kuthy (2002), one obtains a theory which predicts that subjects can only be part of a fronted verb phrase if they can be the focus exponent.[15] The sketch of an analysis for an example such as (33c) is illustrated in Figure 3. The entry of *gewinnen* 'to win' (the base form of the verb *gewonnen*) in (33c) in Figure 4 encodes the lexical property that the subject of this intransitive verb has focus projection potential.

Under the assumption that in (33c) the noun *Außenseiter* carries a pitch accent, the information structure principle for words in (9) on p. viii ensures that the noun contributes its LOGICAL-FORM value to its FOCUS value. The focus projection principle in (14) on p. xii ensures that the focus can project over the entire NP

[15] Not every element in a syntactic phrase corresponding to the focus is prosodically prominent. Generally only one elementis: the so-called *focus exponent* (cf. Selkirk 1995).

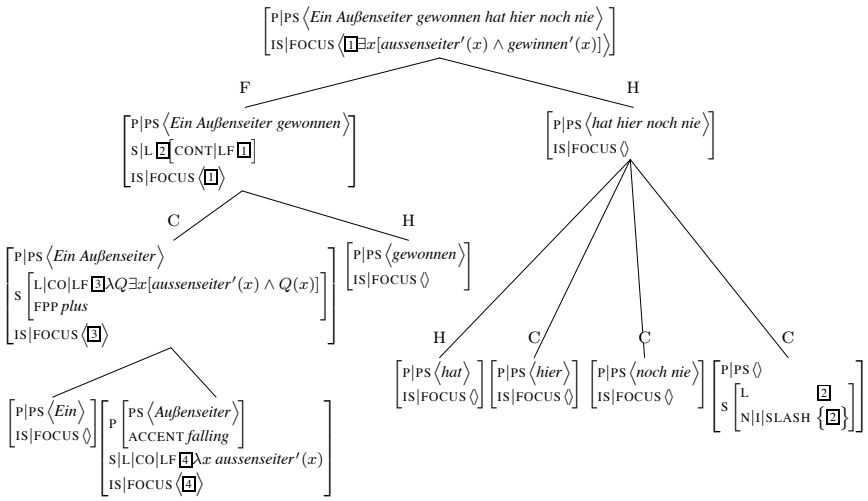

Figure 3: Partial VP fronting in De Kuthy & Meurers (2003)

$$\begin{bmatrix} \textsc{phon} & \langle \textit{gewinnen} \rangle \\ \textsc{arg-s} & \left\langle \begin{bmatrix} \textsc{fpp} & \textit{plus} \\ \textsc{loc|cat|head|case} & \textit{nom} \end{bmatrix} \right\rangle \end{bmatrix}$$

Figure 4: The lexical entry of *gewinnen* 'to win'

ein Außenseiter, i.e., its FOCUS element is identical to its LF value. Since *ein Außenseiter* as the subject of *gewonnen* in the tree in Figure 3 is lexically marked as FPP *plus*, the principle governing focus projection in the verbal domain in (14) licenses the focus to project over the entire fronted verb phrase *ein Außenseiter gewonnen*. The fronted constituent thus contributes its LF value to its FOCUS value. In this example, the focus does not project further, so that in the head-filler phrase the focus values of the two daughters are simply collected as licensed by the first disjunct of the focus principle in (14) discussed earlier in Section 3.2.2. As a result, the FOCUS value of the fronted verb phrase is the FOCUS value of the entire sentence. Finally, note that the example satisfies Webelhuth's generalization, which requires a fronted verb phrase to be the focus of the utterance as formalized in the principle in (34).

In the same spirit, Bildhauer & Cook (2010) show that sentences in which multi-

ple elements have been fronted are directly linked to specific types of information structure. In German, a V2 language, normally exactly one constituent occurs in the position before the finite verb in declarative sentences. But so-called multiple fronting examples with more than one constituent occurring before the finite verb have been well attested in naturally-occurring data (Müller 2003). Two examples from Bildhauer & Cook (2010) are shown in (35).[16]

(35) a. [Dem Saft] [eine kräftigere Farbe] geben Blutorangen.
to.the juice a more.vivid colour give blood.oranges
'What give the jiuce a more vivid colour is blood oranges.'

b. [Stets] [einen Lacher] [auf ihrer Seite] hatte die Bubi Ernesto Family.
always a laugh on their side had the Bubi Ernesto Family
'Always good for a laugh was the Bubi Ernesto Family.'

But, as discussed by Bildhauer & Cook, such multiple fronting examples seem to require very special discourse conditions in order to be acceptable. Just like the fronted verb phrases discussed in De Kuthy & Meurers (2003) above, Bildhauer & Cook (2010) propose analyzing multiple fronting constructions in German as head-filler phrases which in this case introduce a topic shift. Following the approach by Müller (2005), multiple fronting configurations can be identified via the filler daughter which must have a HEAD|DSL (double slash) value of type *local*.[17] As introduced above, Bildhauer & Cook (2010) assume that an information structure attribute is specified in *synsem* objects, with the features FOCUS and TOPIC taking lists of *elementary predications* as their values. In general, multiple fronting *head-filler* phrases are restricted by the constraint in (36).

(36) Relating multiple fronting to focus (Bildhauer & Cook 2010: 75):

$$\begin{bmatrix} \textit{head-filler-phrase} \\ \text{NON-HEAD-DTRS} \ \langle [\text{LOC|CAT|HEAD|DSL} \ \textit{local}] \rangle \end{bmatrix} \rightarrow \left[\text{IS} \ \textit{pres} \vee \textit{a-top-com} \vee \ldots \right]$$

$$\begin{bmatrix} \textit{head-filler-phrase} \\ \text{IS} \ \textit{pres} \end{bmatrix} \rightarrow \begin{bmatrix} \text{SS|LOC|CAT|HEAD|DT} \ \langle [\text{LOC|CONT|RELS} \ \boxed{1}] \rangle \\ \text{HD-DTR|SS|IS|FOCUS} \ \langle \boxed{1} \rangle \end{bmatrix}$$

[16] The examples are corpus examples that were extracted by Bildhauer & Cook (2010) from Deutsches Referenzkorpus (DeReKo), hosted at the Institut für Deutsche Sprache, Mannheim: http://www.ids-mannheim.de/kl/projekte/korpora

[17] In Müller's (2005) formalization, filler daughters in multiple fronting configurations (and only in these) have a HEAD|DSL value of type *local*, i.e., they contain information about an empty verbal head. The DSL ('double slash') feature is needed to model the HPSG equivalent of verb movement from the sentence-final position to initial position.

The first constraint ensures that *head-filler* phrases that are instances of multiple frontings are restricted to have an IS-value of an appropriate type.[18] The second constraint then ensures that in presentational multiple frontings, the designated topic of the head daughter (i.e. the verbal head of the *head-filler-phrase*) must be focused. The feature DT (designated topic) lexically specifies which element, if any, is normally realized as the topic of a particular verb. This constraint thus encodes what Bildhauer & Cook (2010) call "topic shift": the non-fronted element in a multiple fronting construction that would preferably be the topic is realized as a focus. A similar constraint is introduced for another instance of multiple frontings, which is called *propositional assessment* multiple fronting. Here it has to be ensured that the designated topic must be realized as the topic somewhere in the head daughter and the head daughter must also contain a focused element.

Webelhuth (2007) provides another account of the special information structural requirements of fronted constituents, in this case of predicate fronting in English that is based on the interaction of word order and information structural constraints.

(37) I was sure that Fido would bark and *bark he did*.

The principles part of Webelhuth's account require that in such cases of predicate fronting, the auxiliary is focused and the remainder of the sentence is in the background. The two principles needed for this interaction are shown in (38).

(38) Predicate preposing phrases (Webelhuth 2007):

$$\begin{bmatrix} \textit{aux-wd} \\ \text{ARG-S} \ \langle \text{NP, gap-ss} \rangle \end{bmatrix} \rightarrow \begin{bmatrix} \text{SS|STATUS} \ \textit{foc} \\ \text{ARG-S} \quad \langle \begin{bmatrix} \text{STATUS} \ \textit{bg} \end{bmatrix}, \textit{gap-ss} \rangle \end{bmatrix}$$

$$\begin{bmatrix} \textit{PRED-PREPOS-PH} \end{bmatrix} \rightarrow \begin{bmatrix} \textit{HD-FILL-PH} \\ \text{NON-HD-DTR} \ \begin{bmatrix} \text{SS|STATUS} \ \textit{bg} \end{bmatrix} \end{bmatrix}$$

The first constraint ensures that auxiliary words whose predicate complement has the potential to be preposed (i.e. is of type *gap-ss*) have the information status *focus*, whereas the status of the first argument (the subject) is *background*. Additional constraints then ensure that auxiliary words with a gapped second argument can only occur in predicate preposing phrases, and vice versa, that predicate preposing phrases contain the right kind of auxiliary.

[18] Bildhauer & Cook (2010: 75) assume that the type *is* as the appropriate value for IS has several subtypes specifying specific combinations of TOPIC and FOCUS values, such as *pres* for presentational focus or *a-top-com* for assessed-topic-comment.

7 Information structure and prosody

A lot of languages mark information structure prosodically, like for example English and German, where pitch accents of various shapes are used to mark focus. Accordingly, several of the approaches discussed above include a component which enriches the phonology representation of signs such that it allows the integration of the necessary prosodic aspects like accents.

Engdahl & Vallduví (1996) assume that signs can be marked for particular accents signaling focus or links in English, so-called A and B accents. In a similar way, De Kuthy (2002) extends the value of PHON such that it includes a feature ACCENT, in order to formulate constraints on the connection between accents and information structure markings. Most of approaches discussed above do not include a detailed analysis of the prosodic properties of the respective language that is being investigated with respect to discourse properties. As a result, most approaches do not go beyond the postulation of one or two particular accents, which are then somehow encoded as part of the PHON value. These accents more or less serve as an illustration of how lexical principles can be formulated within a particular theory that constrain the distribution of information structural values on the lexical level. The more articulate such a representation of PHON values including accent pattern, intonation contours, boundary tone, etc. is, the more detailed the principles could be that are needed to connect information structure to prosodic patterns in languages that signal discourse properties via intonation contours.

In Bildhauer (2008), one such detailed account of the prosodic properties of Spanish is developed together with a proposal for how to integrate prosodic aspects into the PHON value, also allowing a direct linking of the interaction of prosody and information structure. In his account, the representation of PHON values in HPSG is enriched to include four levels of prosodic constituency: phonological utterance, intonational phrases, phonological phrases and prosodic words. The lowest level, prosodic words of type *pwrd*, include the feature SEGS, which corresponds to the original PHON value assumed in HPSG, and additional features such as PA for pitch accents or BD for boundary tones, which encodes whether a boundary tone is realized on that word. The additional features UT (phonological utterance), IP (intonational phrase) and PHP (phonological phrase) encode via the typ *epr* (edges and prominence) which role a prosodic word plays in higher level constituents. For example, the feature DTE (designated terminal element) specifies whether the word is the most prominent one in a phonological phrase. A sign's PHON list then contains all *pwrd* objects, and relational constraints de-

fine the role each prosodic word plays in the higher prosodic constituents. This flat representation of prosodic constituency still makes it possible to express constraints about intonational contours associated with certain utterance types. One example discussed in Bildhauer's work is the contour associated with broad focus declaratives in Spanish, which can be decomposed into a sequence of late-rise (L*H) prenuclear accents, followed by an early-rise nuclear accent (LH*), followed by a low boundary tone (L%). The constraint introduced to model this contour for declarative utterances thus instantiates the BD value (boundary tone) of the last *pwrd* (prosodic word) in the PHON list to *low*, instantiates a nuclear pitch accent *low-high-star* on this rightmost prosodic word and ensures that a prenuclear pitch accent *low-star-high* is instantiated on every preceding compatible prosodic word. The constraint encoding this is shown in (39).

(39) Intonational contour of Spanish declarative utterances (Bildhauer 2008: 142):

$$\textit{decl-tune}(\boxed{1}) \leftrightarrow \boxed{1} = \boxed{2} \oplus \left\langle \begin{bmatrix} \text{PA} & \textit{low-high-star} \\ \text{BD} & \textit{low} \end{bmatrix} \right\rangle \wedge$$
$$\boxed{2} = \textit{list}\left(\begin{bmatrix} \text{BD} & \textit{none} \end{bmatrix}\right) \wedge$$
$$\boxed{2} = \textit{list}\left(\begin{bmatrix} \text{PA} & \textit{none} \end{bmatrix}\right) \bigcirc \textit{list}\left(\begin{bmatrix} \text{PA} & \textit{low-star-high} \end{bmatrix}\right)$$

$$\begin{bmatrix} \textit{sign} \\ \text{EMBED} & - \end{bmatrix} \rightarrow \left[\text{PHON } \boxed{1}\right] \wedge \textit{decl-tune}(\boxed{1})$$

The second constraint in (39) ensures that only unembedded utterances can be constrained to the declarative prosody described above. That this specific contour is then compatible with a broad focus reading is ensured by an additional principle expressing a general focus prominence constraint for Spanish, namely that focus prominence has to fall on the last prosodic word in the phonological focus domain, which, in the case of a broad focus, can be the entire utterance. The principle formulated in Bildhauer's account is shown in (40).

(40) Focus prominence in Spanish (Bildhauer 2008: 146):

$$\begin{bmatrix} \textit{sign} \\ \text{CONT} & \boxed{1} \\ \text{FOC} & \boxed{1} \end{bmatrix} \rightarrow \left[\text{PHON } \textit{list} \oplus \left\langle \left[\text{UT}|\text{DTE} \quad +\right] \right\rangle\right]$$

Since only words that are the designated terminal element (DTE) can bear a pitch accent, the interplay of the two principles above ensures that in utterances with a declarative contour the entire phrase can be in the focus. These principles thus illustrate nicely not only how lexical elements can contribute to the information structure via their prosodic properties, but also how entire phrases with specific

prosodic properties can be constrained to have specific information structural properties.

The approach of Song (2017) also includes a component that captures the interaction between prosodic properties of utterances and the effect on the information structure. In order to include information structural constraints of the so-called A and B accents in English, several components of Bildhauer's (2007) phonological architecture are adapted for the information structural setup in Song (2017). Among them is the idea that in a phonological phrase (encoded in the feature phonological utterance UT), focus prominence is related to the most prominent word in that phrase, which is encoded via the constraint in (41).

(41) Prosodic marking of focus (Song 2017: 159):

$$\textit{lex-rule} \rightarrow \begin{bmatrix} \textsc{ut}|\textsc{dte} & \boxed{1} \\ \textsc{mkg}|\textsc{fc} & \boxed{1} \end{bmatrix}$$

Specific lexical principles for the A and B accents then ensure the correct information structural marking and specifiy which type of element has to be present on the ICONS list. The specification necessary for English A accents that signal focus (here characterized as *high-star*) are shown in (42).

(42) Focus marking of A accents in English (Song 2017: 160):

$$\textit{fc-lex-rule} \rightarrow \begin{bmatrix} \textsc{ut}|\textsc{dte} & + \\ \textsc{pa} & \textit{high-star} \\ \textsc{mkg} & \textit{fc-only} \\ \textsc{index} & \boxed{1} \\ \textsc{incons-key} & \boxed{2} \\ \textsc{c-cont}|\textsc{icons} & \langle\, !\, \boxed{2} \begin{bmatrix} \textit{semantic-focus} \\ \textsc{target}\ \boxed{1} \end{bmatrix} !\, \rangle \\ \textsc{dtr}|\textsc{head} & \textit{+nv} \end{bmatrix}$$

8 Conclusion

I have discussed various possibilities for how to represent information structure within HPSG's sign-based architecture. Several approaches from the HPSG literature were presented which all have in common that they introduce a separate feature INFO-STRUC into the HPSG setup, but they differ in (i) where they locate such a feature, (ii) what the appropriate values are for the representation of information structure and (iii) how they encode principles constraining the distribution and interaction of information structure with other levels of the grammatical architecture. Finally, I discussed a number of theories in which phenomena such as word order are constrained to only be well-formed when they exhibit specific information structural properties.

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Part IV

Other areas of linguistics

Chapter 25

Diachronic syntax

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Basic questions of language change concern the what, how, why of a change. The present paper focusses on syntactic change and addresses the question how a representational framework as HPSG can be used to model syntactic change. Taking the history of German as a showcase, different types of morpho-syntactic changes are considered including changes within the verb phrase as well as the noun phrase.

1 Dimensions of syntactic change

Syntactic change links the language of two speech communities which are chronologically related such as Old and Modern Norwegian. Only the grammar of the first speech community allows null subjects in restricted contexts, while referential subjects are obligatory in Modern Norwegian. As shown by Kinn (2015), Norwegian changes from a partial null-subject language to a language disallowing null subjects.

(1) a. Sægir hann þat at æigi man *pro* satt vera. (Old Norwegian)
says he that that not can [it] true be
'He says that it cannot be true.'

b. Han sier at ∗(han) ikke kan komme. (Modern Norwegian)
he says that he not can come
'He says that he cannot come.'

The reinterpretation of non-subjects as subjects in the history of English provides a second example (Denison 1993): A verb like *langian* 'long for' selects an accusative but no nominative noun phrase in Old English as exemplified in (2).

Ulrike Demske. N.d. Diachronic syntax. In Stefan Müller, Anne Abeillé, Robert D. Borsley & Jean-Pierre Koenig (eds.), *Head-Driven Phrase Structure Grammar*. prepublished version. Berlin: Language Science Press. [Preliminary page numbering]

As shown by the translation, the experiencer argument of the verb *long* has been promoted from object to subject in Modern English.

(2) þa ongan hine eft langian on his cyþþe (Old English)
then began him.ACC again long for his native land
'Then he began again to long for his native land.'

Linking (1a) and (1b) as well as the English versions of (2) in terms of syntactic change would amount to the linking of surface manifestations instead of the underlying grammars. And it is in fact the underlying grammar that is affected by syntactic change triggered by internal and external factors. Internal factors belong to the linguistic system and may be part either of the syntax or any other module of the grammar as the morphology or the lexicon. As regards the syntactic change in the history of English, illustrated above, it may be taken as lexically driven, modifying the argument structure of verbs with experiencer objects, as suggested by (Denison 1993). Lightfoot (1979) on the other hand considers the change to be syntactically driven, i.e. as an effect of the word order change from OV to VO orders in the history of English.

The impact of morphological changes on the syntactic component of the grammar has always been of particular importance in diachronic syntax. Strong correlations are supposed to hold between a rich morphology on the one hand and the possibility of for instance word order variation or null subjects. Thus an attested collapse of case distinctions may be made up by a less variable word order with structural positions conveying the information formerly provided by case markers. The loss of morphology may also be compensated by replacing case marked noun phrases by prepositional phrases with prepositions now providing the relevant information. A pertinent example from English concerns the loss of adnominal genitives as a consequence of the loss of the genitive as a morphological case. While the postnominal genitive phrase is superseded by the *of*-phrase, the prenominal genitive marker is reanalyzed as a clitic (Allen 2006). In Old English, adnominal genitives are attested in pre- and post-head position.

(3) a. & þær wæs Kola ðæs cyning-es heahgereafa (Old English)
and there was Kola the.GEN king-GEN high reeve
'And there was Kola, the king's high reeve.'

b. þæt wæron þa ærestan scipu deniscra monna þe … (OE)
that were the first ships Danish.GEN men.GEN which …
'those were the first ships of Danish men which …'

Syntactic change may also be driven by external factors such as language

processing, information packaging or language contact: According to Hawkins (2004), grammars conventionalize syntactic structures depending on their degree of preference in performance. And the rise of VO patterns in the German variety of Cimbrian is due to its contact with the Italian VO order in the North Eastern part of Italy (Grewendorf & Poletto 2005).

(4) a. Haütte die Mome hat gebläscht di Piattn. (Cimbrian)
today the mother has washed the plates
'Today, mother has washed the plates.'

b. Heute hat die Mutter die Teller gespült. (Present-day German)
today has the mother the plates washed

Derivational approaches such as Government and Binding and Minimalism assume that language change happens in the course of first language acquisition. Individual language learners reanalyze the linguistic input they get during the acquisition process, resulting in the resetting of a parameter value (Lightfoot 1979). The nature of parameters has substantially changed from GB to Minimalism: Resetting of a parameter value in terms of GB meant for the loss of null subjects, as illustrated in (1a) and (1b), for instance that the value from the null-subject parameter changed from [+] to [-] in the history of Norwegian. The minimalist view of parameters restricts parametric variation to lexical items in general and to the formal features of functional heads in particular (Borer-Chomsky Conjecture according to Baker (2008)). The null-subject parameter will then be phrased in terms of a feature bundle associated with a functional verbal head with the loss of null-subjects triggered by the absence of particular features. Depending on the range of specific formal features, Biberauer & Roberts (2017) distinguish four types of parameters according to their size: macro-, meso-, micro-, and nanoparameters, with the first type being the most stable one in the development of a language (e.g. rigid head-final or head-initial order). They further claim that formal features are not pre-specified in Universal Grammar but emerge from the interaction of Universal Grammar, primary linguistic data, and general cognitive optimization strategies in the sense of Chomsky (2005). Two principles in particular are suggested by Biberauer & Roberts (2017): (i) feature economy, restricting the acquisition of features to those with robust evidence in the input data, thereby minimizing computation; and (ii) input generalization, requiring to make maximal use of the acquired features. A case in point for the latter strategy are languages with harmonic head-final or head-initial word orders triggered by the generalization of the head parameter. The resetting of parameters in a Minimalist framework is therefore no longer restricted to the linguistic system, but

includes external factors such as acquisition strategies. Since robust evidence in the primary linguistic data is required to allow a particular formal feature to be present in the underlying grammar, its frequency in the linguistic input will play a prominent role. And here further external factors come into play: Processing ease as well as language contact might affect the frequency of individual variants in the lifespan of a speaker, thus modifying her output and consequently the input of language learners. A case in point is the continuous form in Pennsylvania German (Louden 1988): While the pattern is still restricted in Common Pennsylvania German (1850–1950), it is widely spread in Plain Pennsylvania German (since 1950) motivated by the contact with its English counterpart. Another instance is the contact between Low German and Swedish. As shown by Petzell (2016), Swedish scribes of Low German frequently use a VO instead of an OV order, motivated by their L1 language. Such changes might result in changes of the underlying grammar of subsequent generations.

(5) a. er lasst de Hund los (Common Pennsylvania German)
he lets the dog loose

b. er is de Hund an los lasse (Plain Pennsylvania German)
he is the dog PREP loose let
'He is letting the dog loose.'

Under the assumption that syntactic change is triggered by changes affecting the lexicon, one might conclude that there is no such thing as syntactically triggered change, as Biberauer & Walkden (2015) actually suggest. We would then expect that lexicalist approaches to syntactic change such as HPSG or LFG are at least equally well suited as derivational approaches to model syntactic change, cf. Vincent (2001) and Börjars & Vincent (2017) for LFG. The remainder of the paper will hence provide some case studies to illustrate how HPSG can be used to model the way structure can change over time. All case studies are taken from the history of German.

The outline is as follows: Grammaticalization processes are exemplified by the rise auf auxiliary verbs in section 2.1. Changes with respect to word order are addressed in sections 2.2 regarding verb clusters and 2.3 with respect to word order changes within the noun phrase. Overall, section 2.3 is devoted to various changes affecting the left periphery of noun phrases and also touches upon the issue why particular changes happen.

2 Case studies

The case studies presented in this section are supposed to exemplify different types of syntactic change. Grammaticalization processes typically give rise to grammatical markers with the development of auxiliary verbs from main verbs figuring as a prominent example. The next section will therefore deal with the emergence of the passive auxiliaries *kriegen*, *bekommen* 'get' and *geben* 'give' in the history of German. A second type of change are word order changes which are the topic of section 2.2, focussing on the order of verbs at the right clausal periphery in German, a syntactic change which has attracted a lot of interest from a descriptive as well as a more formal perspective. The third case study addresses several changes affecting the left periphery of noun phrases, including the grammaticalization of the definite determiner as well as the word order change of adnominal genitives.

2.1 Grammaticalization: rise of auxiliary verbs

Grammaticalization processes have an impact on the way grammatical information is marked in a language. Grammatical information such as verbal mood may be expressed either by morphological means as in (6a) or by syntactic means as in (6b) which uses the auxiliary verb *werden* to convey a modal meaning. With the grammatical meaning being alike, a morphological marker such as *-e* in (6) is taken to be further down on the grammaticalization cline as the corresponding auxiliary verb because of its morphological boundedness.

(6) a. Fred ging-e ins Kino. (Present-day German)
Fred went-SBJV to.the movies

b. Fred würde ins Kino gehen. (Present-day German)
Fred SBJV to.the movies go
'Fred would go to the movies.'

Further prominent examples of grammaticalization processes involve the rise of negation markers in French such as *pas* from the Latin noun *passus* 'step' or *personne* 'no-one' which both were originally restricted to a positive meaning. A well-known German example for a grammaticalization process is the subordinating conjunction *weil* 'because' evolving from the noun *Weile* 'while'. Grammaticalization typically consists of a reduction in meaning (lexical » grammatical) and in form (syntactic marker » morphological marker).[1]

[1]Cf. Lehmann (2015) for his seminal work on issues of grammaticalization.

As regards the class of auxiliary verbs in Present-day German, the verbs *kriegen* and *bekommen*, both meaning 'get', are fairly recent members of this class (Reis 1976). They pattern with passive auxiliaries such as *werden* 'get' and *sein* 'be' in German, triggering classic diagnostics for passive constructions: An object of the active counterpart figures as subject of the finite verb in the passive clause, and the subject of the active clause is optionally realized as *von*-PP in its passive equal. A crucial difference to the canonical passive construction concerns the status of the object: It is not the direct but the indirect object which becomes the subject of the passive clause, hence the term *dative passive*.[2] In (7), the indirect object of *sagen* 'tell' was promoted to grammatical subject of *bekommen*,favored by the fact that both verbs select for experciencer arguments although in different slots of their argument structure. The *dass* 'that'-clause can only be understood as an argument of *sagen* 'tell', providing evidence for an analysis of *bekommen* 'get' as auxiliary.

(7) Ich habe nur gesagt bekommen, dass er Probleme mit den Hinterreifen
I have only told got that he problems with the rear tires
hat. (BRZ13/APR.07807)
has
'I was just told that he has problems with his rear.tires.'

Both verbs *kriegen* 'get' as well as *bekommen* 'get' have developed a grammatical meaning alongside their lexical meaning in the recent history of German (Glaser 2005; Lenz 2012). Early examples for their use as auxiliary verbs come from the 16th and the 17th century with both auxiliaries typically combining with past participles of lexical verbs which select for experiencer arguments in object position (*schenken* 'grant', *schicken* 'send'), which may be interpreted as experiencer arguments of the governing predicate. The same holds for the theme argument which may be selected either by the lexical verb or the emerging auxiliary. Examples as in (8) therefore represent the beginning of the grammaticalization process. Diagnostics for the passive construction include the *von*-phrase in (8a) as well as the valency alternation turning the indirect objects of the corresponding active clause into subjects of the passive clause.

[2] The focus here is on the passive meaning of the verbs in question. Resultative uses of *bekommen, kriegen* 'get' are disregarded in the present context. *Selma kriegt die Gleichung gelöst* 'Selma manages to solve the equation', means that *Selma* is an agent argument reaching a particular goal with some effort with the auxiliary conveying an active meaning. Cf. Reis (1985) for a discussion of both types of constructions.

(8) a. da hatte ich eben ein paar Ducaten vom Herrn geschenckt
EXPL had I just a few ducats by the master granted
kriegt (1672: Weise)
got
'I just got a few ducats by the master.'

b. Es verdrüst sie/ daß du Wein hast geschickt bekommen/ und sie
EXPL annoys her that you wine have send got and she
keinen. (1695: Reuter)
none
'She is annoyed, because you got wine, but she has not.'

Examples like (8) are taken to represent stage 1 in the grammaticalization process, while examples like (7) are instantiations of stage 2, because the direct object can only be interpreted as argument of the non-finite verb.[3] Stage 3 on the grammaticalization cline includes verbs with a privative semantics, indicating that the emerging auxiliary is grammaticalized to such a degree that indirect objects are no longer restricted to recipient arguments. The use of intransitive verbs like *helfen* 'help' are considered to represent stage 4 on the grammaticalization path (Ebert 1978).

(9) a. Aber nach einer Woche hatte sie noch nicht einmal die Fäden
but after one week had she.NOM not again the stitches
gezogen bekommen. (RHZ03/DEZ.09011 RZ)
removed got
'After one week, she had not again removed the stitches.'

b. Sie wollen konkret geholfen bekommen. (PHE/W18.00094)
sie.NOM want definitely helped get
'They definitely want to get help.'

The use of *kriegen, bekommen* 'get' as passive auxiliaries is attested in all German varieties with stilistic differences between the two verbs.[4] This does not hold for the verb *geben* 'give' which may be used as a passive auxiliary only in certain dialects. Like *kriegen* and *bekommen*, the verb *geben* developed into a passive auxiliary in the recent history of German (Lenz 2007). As (10) shows, the experiencer argument of *mitnehmen* 'give a lift' appears as subject of the auxiliary

[3] These examples provide evidence against the claim that the direct object is assigned a thematic role by both the finite and the nonfinite verb, cf. Haider (1986).

[4] While *bekommen* is used in the standard variety of German, *kriegen* is confined to less formal registers. The verb *erhalten* 'get' is only rarely used as an auxiliary with a passive meaning.

geben 'give', while the agent argument is realized by a *von*-phrase as expected in a passive construction.[5]

(10) De Tobi gebbt vom Yannick mitgehol. (West Central German)
the Tobi gives by the Yannick given a lift
'Tobi is given a lift by Yannik.'

In a minimalistic framework, grammaticalization processes are modeled as a categorial reanalysis of lexical categories as functional categories or of hierarchically lower functional categories as higher ones in line with the Borer-Chomsky Conjecture (Roberts & Roussou 2003). In many instances, grammaticalization means the loss of features, as predicted by a cognitive optimization strategy as feature economy. How do declarative frameworks such as LFG or HPSG account for this type of change?

An HPSG analysis of the dative passive in Present-day German includes a lexical entry for the passive auxiliary *bekommen* and a lexical rule deriving the lexical entry for a passive verb from its active counterpart. The feature description for the passive auxiliary in (11) captures the fact that auxiliaries are underspecified for their argument structure, i.e. *become* takes as its complement the passive participle and all the complements the passive verb requires. In contrast to the passive participle in the standard passive, participles in dative passive constructions may assign accusative case when an appropriate argument is present. Examples as (9b) have shown that the dative passive is not restricted to ditransitive verbs in Present-day German as has been claimed by Kordoni & van Noord (2009).

(11) *bekommt*-AUX 'gets':

$$\left[\begin{array}{l}\textsc{phon}\ \langle\ \textit{bekommt}\ \rangle \\ \textsc{synsem|loc|cat}\left[\begin{array}{ll}\textsc{head} & \left[\begin{array}{ll}\textit{verb} & \\ \textsc{vform} & \textit{fin} \\ \textsc{aux} & + \end{array}\right] \\ \textsc{arg-st} & \left\langle \left[\begin{array}{ll}\textsc{head} & \textit{passive-part} \\ \textsc{arg-st} & \left\langle\ \mathrm{NP}[\textit{nom}]_{\boxed{1}},\ (\mathrm{NP}[\textit{acc}]_{\boxed{2}})\ \right\rangle\end{array}\right]\right\rangle\end{array}\right]\end{array}\right]$$

The passive lexical rule derives the passive participle subcategorized by the auxiliary *bekommen* 'get', illustrated by way of its input and output feature description

[5] Thanks go to Christian Ramelli for his native speaker judgment as regards the West Central German variety spoken in the Eastern part of the Saarland.

in (15) and (14), cf. Müller (2018: 285) for the standard passive construction in German. The dative passive rule suppresses the most prominent argument, the agent, of the active verb and promotes the argument marked for dative case by the active verb, the beneficiary, to subject of the passive verb *verordnet* 'prescribed'. The theme argument is not affected by the dative passive rule.[6]

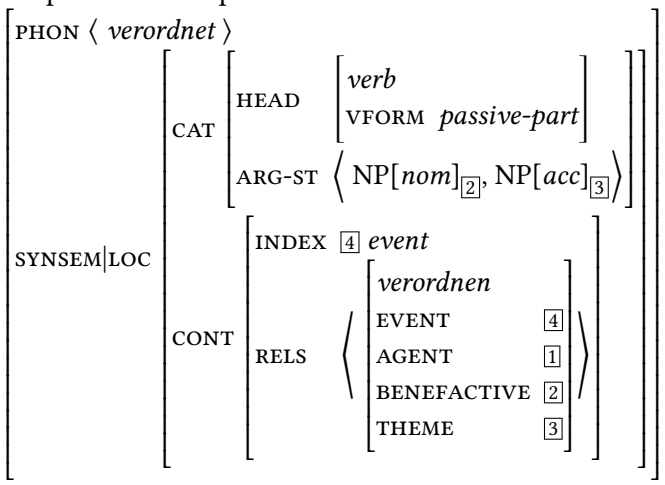
(12) Er bekommt strenge Bettruhe verordnet.
he.NOM gets strict bed rest.NOM prescribed
' Strict bed rest was prescribed to him.'

(13) Input *verordn-* 'prescribe'

$$\left[\begin{array}{l}\textsc{phon}\ \langle\ \textit{verordn}\ \rangle \\ \textsc{synsem|loc}\left[\begin{array}{ll}\textsc{cat} & \left[\begin{array}{ll}\textsc{head} & \textit{verb} \\ \textsc{arg-st} & \left\langle \text{NP}[\textit{nom}]_{\boxed{1}}, \text{NP}[\textit{dat}]_{\boxed{2}}, \text{NP}[\textit{acc}]_{\boxed{3}} \right\rangle\end{array}\right] \\ \textsc{cont} & \left[\begin{array}{ll}\textsc{index} & \boxed{4}\ \textit{event} \\ \textsc{rels} & \left\langle \left[\begin{array}{ll} & \textit{verordnen} \\ \textsc{event} & \boxed{4} \\ \textsc{agent} & \boxed{1} \\ \textsc{benefactive} & \boxed{2} \\ \textsc{theme} & \boxed{3}\end{array}\right] \right\rangle\end{array}\right]\end{array}\right]\end{array}\right]$$

[6] Assuming a lexical rule to derive a passive participle that fits the requirements of the passive auxiliary *bekommen*, results in three different participles, i.e. perfect participle, passive participle for standard passive constructions and passive participle for dative passive constructions. Müller (2018) argues that only one lexical rule is needed to derive the past participle. According to him, the respective auxiliary determines which arguments are realized in a perfect or a passive context. Whether his analysis is better suited to fit the participle data in German does not touch upon the issue of the grammaticalization process illustrated here.

(14) Output *verordnet* 'prescribed'



In view of the analysis of the dative passive in Present-day German, its rise in the history of German may be modeled in terms of a change modifying the CONTENT feature of the verb *bekommen*. Semantic bleaching of the main verb in the course of its grammaticalization process affects above all its argument structure: The lexical verb *bekommen* assigns the thematic role beneficiary to its subject argument and a theme role to its direct object, cf. (15). The auxiliary *bekommen* on the other hand has no lexical meaning and does not assign thematic roles. The rise of the passive auxiliary *bekommen* can be thought of as taking place in two steps: Starting with the lexical verb *bekommen*, the first step includes its semantic bleaching such that the verb admits verbal complements headed by ditransitive verbs denoting a change of possession. The second step is best characterized by the further bleaching of the auxiliary-to-be: Its distribution is no longer governed by a semantic restriction to verbs denoting a change of possession, but only by a syntactic one, because it requires verbs with a dative object in its active counterpart, cf. (9a). Alongside its bleached version, the verb *bekommen* retains its original status as a lexical verb. The diachronic scenario sketched for *bekommen* 'get' is supposed to hold for the other passive auxiliaries as well.