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Collapsing the Head Final Filter and the Head Complement Parameter

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1. Introduction

In this paper, I will address the issue of how the OV-VO distinction can be captured in a minimalist framework adopting the universal base hypothesis (UBH) (cf. Kayne 1994). In particular, I will argue that head final effects and the head complement parameter can be derived from the workings of a phase-based condition on the mapping between syntactic structure and prosodic structure. The notion of phases that is needed to properly define the interaction between syntax and prosody is more fine-grained than the one proposed in Chomsky (2001, 2005). I will argue that phases and their subphases are defined by predicates and their extended projections in the sense of Grimshaw 1991.

If we dispense with directionality parameters altogether, the question arises of which other properties in language word order facts can be derived from or related to. The ideal candidate with which to locate this type of difference in the minimalist program are interface properties (cf. Chomsky 1995, 1998). Given that languages should not differ at LF, possible candidates are constituted by interface requirements on the mapping to PF. While morphology proper is a good candidate for explaining OV-properties in agglutinating languages, word order differences between the Germanic languages that belong to the inflectional type call for an alternative explanation.

Thus, I would like to explore the question of whether the major word order differences between the Germanic OV- and VO-languages can be related to major differences in the mapping between syntactic structure and prosodic structure in these languages.

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1.1. Differences between German and English

A property that correlates with the head complement parameter is the placement of event related adjuncts in the Germanic OV- and VO-languages. Time, place and manner adjuncts occur preverbally in German, but postverbally in the exact mirror order in English, in the unmarked case, as is illustrated in (1ab). The qualification *in the unmarked case* here is important, since both English and German allow for alternative orders, as is illustrated in (2a) and (2b) respectively.

(1) a. C T P M-V OV-languages
b. C V- M P T VO-languages

(2) a. John carefully read the book this Tuesday in the garden of his friend
b. Der Hans hat die Maria besucht gestern in Wien
The John has the Maria visited yesterday in Vienna

In this paper, I will address the question of which property defines the unmarked order of these elements and put aside the issue of how alternative orders can be derived in these languages. The generalization in (1) raises the question of which property connects the head complement parameter with the default placement of event-related adjuncts. Obviously, the instrument of the head complement parameter is insufficient to accommodate this correlation. Ideally, there should be a common underlying property from which the placement of both complements and event-related adjuncts follows.

The proposal that I would like to make in this paper is that the placement of arguments and these adjuncts in English and German follows from a unique condition in which prosodic weight plays a crucial role. Most importantly, the heaviness of a syntactic phrase will be defined by applying metrical restrictions on the branching nature of syntactic constituents. The main idea that I will argue for is that heavy syntactic phrases must be spelled out on the right branch with respect the selecting/modified head, if the mapping between syntactic structure and prosodic structure in the containing phase is quantity-sensitive.

One difference between VO-languages like English and OV-languages like German that strikes me as being essentially prosodic in nature is the fact that adjuncts that can occur between the subject and the vP in VO-languages are subject to restrictions absent in OV-languages (cf. Haider 2000).

(3) a. John (more) often (* than Peter) read the book
b. Hans hat öfter (als der Peter) das Buch gelesen
c. John very carefully read the book
d.* John with care read the book

The data in (3), in particular the contrast between (3c) and (3d), shows that we cannot simply resort to the branchingness of a constituent. Descriptively speaking, the head of the adjunct must not have material to its right in VO-languages. This is only possible if the heavy adjunct appears postverbally, raising the question of whether there is a connection between the properties in (1) and (3).

The restrictions illustrated in (3) are reminiscent of head final effects, first discussed by Emonds (1976) and Williams (1982). In section 2, I will discuss head final effects in more detail and argue that these effects as well as the placement of arguments with respect to the selecting head can be derived from a single condition that applies in the syntax-prosody interface.

2. The Head Final Filter

The data in (3) can be captured by a generalized version of the head final filter, given in (5) below. On the basis of contrasts like in (4), Williams (1982) proposed a condition which requires that the head of a prenominal modifier be adjacent to the (modified) noun.

(4) a. [a [$_{AP}$ proud] man]
b. * a [$_{AP}$ proud [of his children]] man

(5) (Generalized) Head Final Filter:
A premodifier must be head final

While the HFF covers a great number of empirical facts (cf. Escribano 2009) and thus constitutes a valid empirical generalization, its status as a genuine syntactic condition is problematic for the following reasons.

2.1. The HFF as a pure syntactic condition

First note that the HFF does not apply to subjects (ie. specifiers of I) as in (6a), intonationally detached DP and PP frames (cf. 6b) and specifiers of other functional heads in the C-domain (cf. 6c).

(6) a. [Students [of linguistics]] read Chomsky a lot
    b. [On [Tuesday evening]] I will take out Mary for dinner
    c. [In [which city]] did John meet Mary?

This raises the question of why the condition should apply to modifiers but not to specifiers. A further question concerns the issue of its crosslinguistic application. As we have seen in the previous section (cf. example (3) above), it arguably applies in the middle field of VO-languages, but fails to apply in the same domain in OV-languages, raising the question of which factor determines whether the filter does apply or not. A possible answer to this is that the HFF is somehow linked to the head complement parameter. Note that this line of thinking leads to a peculiar conclusion, namely that its application in a VO-language like English has the (unexpected) effect that certain types of phrases must be head-final in an otherwise categorially head-initial language. This raises some doubts on whether HF-effects should be treated as purely syntactic effects.

At this point, it is important to note that the HF constraint also applies in an OV-language like German, namely in the nominal domain. Haider (2000) points out that modification in the German NP shares properties with modification in the English vP. Event-related adverbial phrases appear in NP-final position and their relative order is the same as in the English vP, as is illustrated in (7a-b). Furthermore, the complement of an adjective cannot follow the head (cf. the contrast between (8a-c)), while no such restriction applies in the clausal domain (8d).

(7) a. die Überreichung der Oscars in L.A. letzten Sommer
       the presenting (of) the Oscars in L.A. last summer
    b. die Überreichung der Oscars letzten Sommer in L.A.

(8) a. der [auf seine Kinder stolze] Vater
       the of his children proud+Agr father
    b. * der [stolze auf seine Kinder] Vater
    c. der Vater stolz/*stolze auf seine Kinder

    d. weil er [stolz auf seine Kinder] ist
       since he proud of his children is

Given that nominal phrases in German are head-initial, the data in (7)-(8) again raise the issue of whether there could be a connection between the application of this condition and the head complement parameter. The logic could be to assume that German DPs are head-initial since some condition like the HFF constraint applies in its domain which forces the postnominal placement of adjuncts and arguments and that the German IP is head-final since this condition does not apply in its domain, allowing for the preverbal placement of verbal complements and event-related adjuncts.

One possibility that comes to one's mind immediately is to assume a universal head-initial base plus licensing movement of arguments into the I-domain in both English and German. Then, one could assume that the application of this condition forces the postverbal Spell-out of DP-arguments in the V-domain in English, while the non-application of this condition in German allows for the preverbal Spell-out of DP-arguments in the I-domain. This, however, would imply that the HFF filter in principle also applies to Specifiers of functional heads (in order to affect the placment of complements when they have moved into the preverbal/prenominal domain for reasons of (Case-)licensing), raising the question of how the data in (6) above can be accounted for. What is needed is an interface condition that can be taken to apply, say, in the I-domain in English but fails to apply in the domain containing the subject as well as in the C-domain. In particular, what is needed is the concept of a phase that is defined by the set of interface conditions (PF- and LF-ones) that apply in its domain. I will take up this issue in Section 2.3 below.

Furthermore, it is important to note that in newer treatments of modifiers as specifiers of functional heads in the extended projection of the modified category (Cinque 1999), the HFF cannot be stated anymore as a genuine syntactic generalization that is based on the specific syntactic configuration of adjunction. If we get rid of adjunction, a problem arises for the statement of the HFF, since specifiers of functional projections are generally not subject to (5), as we have seen above. At this point we hit a bifurcation. One can either take this fact as a strong argument against Cinque's approach to modification, or adopt his account and look for a more appropriate account of the head-final effects. Here I will undertake the second task, dropping the assumption that the HFF does not apply to specifiers.

This move is in so far not completely unwarranted given the fact that the HFF is not a likely candidate for being a genuine syntactic condition anyway.. Within current minimalist theory, it is best treated as a bare output condition at the PF interface, since order and adjacency are taken to be irrelevant to narrow syntax.

Note furthermore that the condition, as it is stated in (8), cannot be a genuine PF-constraint either, since the structural difference between specifiers and modifiers is no longer visible at PF. Therefore, I conclude that head final effects are in need of a deeper explanation. Its effects can neither be captured by a pure syntactic nor by a pure phonological condition. Alternatively, I propose to derive head final effects from a mapping condition applying in the interface between syntax and phonology. It is generally assumed that prosody has (restricted) access to syntactic structure, as is evidenced by specific proposals in which an initial prosodic structure is built on the basis of syntactic information (cf. Selkirk 1984, Nespor & Vogel 1986).

2.2. The prosodic motivation of HF-effects

In this section, I would like to motivate why HF-effects should be treated as prosodic in nature. One argument comes from the observation that HF-effects in English disappear, if the adjunct is epenthetic, constituting a separate intonational domain, as is indicated by the comma intonation in (9b).

(9) a. * John more often than Peter visited Mary
    b. John, more often than Peter, visited Mary

The observation that the HF-effects are ameliorated if adjunct and verb are mapped into separate intonational phrases clearly speaks in favour of a condition that applies in the formation of prosodic constituents. The second argument comes from crosslinguistic variation. A similar effect appears in Italian, as is illustrated in (10). However, in Italian, contrary to English, a premodifier of the verb may not be modified at all (10b), escaping the head final filter.

(10) a. Gianni pazientemente aspettava l'autobus
     b. *Gianni molto pazientemente aspettatava l'autobus
     c. *Gianni con pazienza aspettava l'autobus

The data in (10) is best captured by assuming that preverbal modifiers may not be heavy, given the well-known fact that branching constituents counts as heavy in the

metrical domain. For instance, a minimal requirement for being weighty enough to form a prosodic word in many languages is a branching foot (comprising a strong and a week syllable).

The head final effects in English resemble more the other minimal weight-requirement on prosodic words: if a foot contains only one syllable, this syllable must be bimoraic, that is, branching at the rhyme level to form a valid prosodic word.

Let us therefore look more closely at a domain in which the notion of prosodic weight and its role for metrical structure building is relatively well understood, namely the domain of foot construction at the word level.

Word-level stress is computed by virtue of foot construction parameters (iambic or trochaic foot, direction left to right, or right to left and so on), where a foot involves one dominant (strong) and at least one recessive (weak) branch. Foot construction systems may be quantity insensitive, quantity-sensitive or quantity-determined. In a quantity-insensitive system, foot construction proceeds on the basis of global parameters (like left- or right-headed foot) independently of the metrical properties of individual syllables. In a quantity-sensitive system, a heavy syllable cannot occupy a recessive branch, as is specified in (11) below, and in a quantity-determined system each dominant branch must be occupied by a heavy syllable. Prosodic word formation in German is an example for the latter case.

(11) weight-sensitivity (at the word level):
     A heavy syllable must occupy a dominant branch, i.e., must be dominated by the head of the foot

Illustrating the working of weight-sensitivity, which, I will argue, constitutes the relevant notion for capturing HF-effects, in case of a potential violation of the condition in (11) an extra (defective) foot is constructed, leading to two adjacent stresses, as is illustrated for a putative example in (12).

In (12), I assume a word-level stress system that has left-headed binary feet and is quantity sensitive. In (12a) the word is parsed into a single binary left-headed foot. Thus, the first syllable receives stress, indicated by bold letters, the second syllable remains without stress, indicated by italics in (12a). In (12b), the creation of a single left-headed foot by mapping the heavy second syllable on a recessive branch leads to a violation of the condition in (11). The conflict is resolved in that the second syllable is mapped onto an additional foot, as is evidenced by the assignment of secondary stress on the second syllable, next to the assignment of primary stress on the first syllable.

(12) a. normal foot construction: CVCV ->(Pwd (Ft **CVC*V***))
b. prosodic repair: CVCVC -> (Pwd (Ft1 **CV**) (Ft2 CVC))

In prosody, a syllable counts as heavy if its right branch, the rhyme, is itself branching, the complexity of the left branch, the onset, being immaterial for calculating its weight.

If we now draw the direct parallels between syllable structure and syntactic structure as determined by the X'-schema, we arrive at the following conclusion. A syntactic phrase should count as (prosodically) heavy, if its right branch is also branching, that is to say, if its head hosts a complement. Thus, we derive the effects of the HFF in English by the way of a prosodic restriction, as is illustrated again in (13).

(13) a. *the proud of his mother man
b. the very proud man
c. the man proud of his mother

(13a) violates the HFF filter since the head of the adjunct and the modified noun are not adjacent to each other. In the prosodic rendition of the HFF, the phrase [proud [of his mother]] counts as metrically heavy and thus should be mapped onto a dominant branch in prosodic structure. The amelioration of the HF-effect in (13c) indicates that the dominant branch in prosodic structure should be identified with a right-branch in syntactic structure. The issue of how the postnominal/postverbal appearance of adjuncts is derived is addressed in section 3 below.

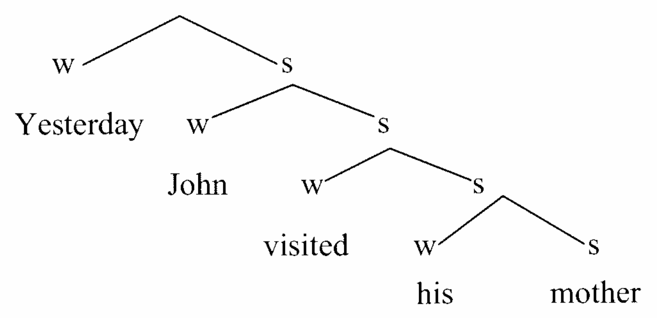
But what is the prosodic status of the modifier in (13b)? Remember that in syllable structure, the complexity of the onset is irrelevant for computing the metrical status of a syllable. Drawing the parallels between syllable structure and syntactic structure, we can thus assume that a constituent that combines a head and a specifier (in its extended projection), even if the latter is complex , does not yield a phrase that counts as prosodically heavy.

Let us now take up the question of why the dominant branch in prosodic structure should be identified with a right branch in syntactic structure. Ideally, the right branch should come out as the dominant branch in syntactic structure and prosodic structure. Since prosodic structure is taken to be derived from syntactic structure, the correlation seems to be well served by assuming asymmetric binary branching syntactic trees.

In anti-symmetric syntax, the dominant branch can be identified with the right branch, on the basis of the fact that the latter constitutes the recursive branch. A standard metrical interpretation of an asymmetric, binary branching syntactic tree

assigns the metrical value *strong* (s) to the right-hand branch at each projection level, as is illustrated in (14).

(14) Yesterday John visited his mother



The metrical interpretation of a syntactic tree in (14) immediately makes clear why HF-effect should apply to premodifiers. The left branch vis-à-vis a nominal or verbal head constitutes a weak branch. If this position is occupied by a heavy syntactic constituent, it will lead to a violation of a parallel condition to the condition in (11), given in (15).

(15) weight-sensitivity (at the sentence level):
A heavy syntactic phrase must occupy a dominant branch in prosodic structure

The metrical interpretation of a syntactic tree also makes clear why the postnominal or postverbal placement of such heavy adjuncts discards the effect: At the word level, with a relative shallow structure, a heavy syllable must not occupy a recessive branch, hence has to occupy a dominant branch. At the sentence level, with a more elaborated hierarchical structure, we may assume that a heavy syntactic phrase must occupy a branch that is more prominent than the branch of the modified head. Thus, by being placed to the right of a noun or verb, a heavy adjunct occupies a stronger branch than the modified head. Since metrical prominence is a relative property between two elements in a given domain, we may assume that the weight condition applies to a syntactic constituent and its selecting/modified head at the point of the derivation in which these elements are joined into a common prosodic constituent.

The property of relative prominence within a given domain implies that HF-effects will disappear, if adjunct and modified head are mapped onto separate intonational domains as in (9b) above, since the condition requires that a heavy adjunct should be more prominent than the modified head in the same domain.

The metrical interpretation of a syntactic tree together with the hypothesis that HF-effects are metrical in nature makes the prediction that HF-effect should appear with modifiers (appearing in left-adjoined positions) and classical specifiers alike. Since subjects and specifiers in the C-domain in English do not display HF-effects, the condition must be taken to apply only in specific domains. The notion that is needed to make this assumption coherent is the notion of a phase. In the following I will assume that phases can be weight-sensitive or not. I will address this issue in more detail in section 2.4 below.

In a syntactic approach that excludes adjunction and assumes that modifiers occupy specifiers of dedicated functional heads in the extended projection of the modified head, all specifiers of this domain, or better put, all specifiers in a weight-sensitive phase must be taken to display HF-effects. Thus, we arrive at the following metrical redition of HF-effects.

(16) The weight condition:
A Specifier that constitutes a heavy syntactic constituent must appear on the right branch with respect to the selecting / modified head (to occupy a more prominent branch than the head in prosodic structure)

To summarize, HF-effects are derived, if we assume that the mapping between syntactic structure and prosodic structure is weight-sensitive in a given domain. The important question becomes now how these domains are defined. Above, I have brought forward some arguments that it should not be determined phrase-structure configurationally. If the interaction between syntax and PF is a stepwise phase-based process, the best candidate for defining the domain is the phase, implying that in certain phases the mapping may be sensitive or may be insensitive to the factor weight. This is the line that I will pursue in the next sections. For the time being, we conclude that the difference between (3a) and (3b) can be captured without invoking the HFF, if we assume that the mapping between syntactic structure and prosodic structure is weight-sensitive in the English IP, but weight-insensitive in the German IP.

2.3. HF-effects and the head complement parameter

In this section, I will address the question of why modifiers in the nominal domain should be subject to the HFF, but modifiers in the verbal domain fail to do so in German. German nominal projections are head initial, while verbal projections in German are head final (at least on the surface). This suggests that there is an intrinsic connection between HF-effects and the head complement parameter. We have already noted above that making the connection in terms of a directionality parameter yields a strange picture: certain constituents, namely modifiers, are required to be head-final within the head-initial projections of N. It would be better to derive both the head complement parameter and HF-effects from a common underlying condition.

Remember that we concluded in the last section that the prosodic rendition of the HFF requires that this condition applies to all specifiers within a weight-sensitive phase. Thus, in an approach in which adjuncts are taken to base-generated to the left of the modified head, namely in its extended projection, and in which arguments are taken to be base-generated in head-initial projections and are assumed to undergo licensing movement into functional specifiers in the extended projections of the selecting head (cf. Kayne 1994), the correlation between the appearance of HF-effects and the head-initial status of the modified head falls out naturally: heavy arguments and adjuncts will have to appear postnominally in the German DP, given that the pronominal domain is weight-sensitive, as we have shown in (8) above.

Arguments in the nominal domain in German are either realized by PPs or genitive DPs. Both types of phrases count as heavy, since they minimally comprise a head and a (filled) complement. Thus, the working of the weight condition alone predicts the postnominal occurrence of arguments, making the head-complement parameter dispensible in the prosodic account of HF-effects that is argued for in this paper.

Note, however, that there is one class of modifiers that appear prenominally in German, namely adjectival adjuncts, as is illustrated in (17). The contrast in (17) is accounted for by the condition in (5) above, since the AP-adjunct in (17a) is clearly head-final, while the PP-adjunct in (17b) is head-initial and thus violates (5).

(17) a. der [seiner Frau treue] Mann
the to-his wife loyal man
b. *der [auf dem Feld] Mann
the on the field man
c. der [seiner Frau **ganz** treue] Mann
the to-his wife entirely loyal man

In the metrical version of (5), the two phrases should differ in their prosodic weight. While the PP in (17b) unequivocally counts as heavy and is thus ruled out correctly, a question arises concerning (17a), since the AP clearly comprises a head and a complement. Does this mean that we have to assume some kind of directionality parameter afterall?

Note, however, that the complement of the adjectival head occupies a Specifier in the extended projection of the adjective and not its complement domain, as is evidenced by the fact that complement and head are separated by a degree modifier, as illustrated in (17c). Nevertheless, we must consider the fact that there is an Agr-head (licensing the DP-argument), the complement domain of which is occupied by the adjective. The crucial point seems to be that this head is empty and thus is prosodically invisible.

A similar problem arises with respect to the examples in (18). In many accounts *too* and *more* are analysed as degree heads that take an AP/AdvP as their complement. In this case, the modifiers in (18ab) should count as prosodically heavy. One way out for the prosodic account could be to assume that these elements (are in fact heads but) occupy the Specifier of an abstract degree head, as is illustrated in (18c). Note that if a standard structure along the lines of (18d) is assumed, then also the HFF in (5) is violated, since the head of the modifying DegrP is not adjacent to the modified verb. The condition in (5) would then have to be changed to the effect that it is the head of the extended projection (in the sense of Grimshaw 1991) of the modifier that needs to be adjacent to the modified category. Such a move, however, would create problems in other cases, as is illustrated in (19). In (19), the head of the extended nominal projection is adjacent to the modified verb, but the modifier in (18) nevertheless induces a HF-effect.

(18) a. John far too often confuses left and right
  b. He has much more carefully read the book (than Peter)
  c. [$_{\text{DegP}}$ [[far] too] Deg^0 [AdvP often]]
  d. [$_{\text{DegP}}$ far [$_{\text{Deg'}}$ too [AdvP often]]]

(19) * since John this morning met Mary

To summarize, the prosodic rendition of HF-effects in (15) actually fares better than the HFF and more complex cases point to the relevance of the generalisation given in (19) below. Considering the data in (17-19), we can further specify the definition of a heavy syntactic phrase, as given in (20).

(20) Parametric option A (Romance)
  A syntactic phrase XP counts as heavy if it is branching

Parametric option B (Germanic)
  a. A syntactic phrase XP counts as heavy if both its head X and the complement of X contain lexical material
  b. The lexical filling of the Specifier of XP is immaterial for computing its weight

The weight condition applies to all specifiers within a given domain. In the parametric option B, computation of prosodic weight is more complex. While constituents occupying specifiers in a weight-sensitive phase must not be heavy, the specifiers of these constituents do not count for computing their prosodic weight in parametric option B.

Let us now look at the interaction of the HFF and the head complement parameter in the verbal domain. In LCA-based accounts to the distinction between head-initial and head-final clauses, it is assumed that complements are base-generated to the right of the selecting head and then moved into a Specifier in the extended projection of this head for licensing purposes, as is illustrated in (21). One way to capture the pertinent distinction in the copy theory of movement is to assume that complements are spelled out in the licensing position in OV-languages, but in their base-position in VO-languages, as is indicated by underlining in (21). These spell-out options can now be derived as weight-effects, if we make the following assumptions.

(21) a. [$_{\text{CP}}$ [$_{\text{IP}}$ $\underline{\text{DP}}$ [$_{\text{vP}}$ v **DP**]]] OV-language (German)
  b. [$_{\text{CP}}$ [$_{\text{IP}}$ **DP** [$_{\text{vP}}$ v $\underline{\text{DP}}$]]] VO-language (English)

As we have concluded in the previous section, the I-domain in English is weight-sensitive, while the I-domain in German is weight-insensitive. If we assume that the HFF applies to all constituents in a given domain (not only to modifiers), then it follows that complements that constitute heavy syntactic phrases must appear postverbally in English. More specifically, a DP or PP complement, counting as prosodically heavy, must be spelled out in the base position in order to occupy a stronger branch than the verb, when a prosodic constituent comprising verb and its complement is formed.

I propose that a phase is evaluated at the point of the derivation at which it is licensed. Therefore it holds that when an argument, which constitutes a phase, is (case) licensed, the result is evaluated prosodically. At this point a prosodic constituent comprising argument and verb is formed (cf. section 4 for details). Hence the weight condition will apply at this point of the derivation and require the postverbal spell-out of the argument in English.

Since in the German IP weight is irrelevant, spell-out must be fixed by other conditions. In Hinterhölzl (2009), I argue for a complementary interface condition on the mapping to LF, which requires that arguments and adjuncts are spelled out in their scope positions (in the I-domain).

Coming back to English, while PP-arguments always can be taken to count as heavy, since they minimally comprise a prepositional head and a complement that is lexically filled, pronominal DPs and DPs made up of only a proper name can be spelled out preverbally or postverbally, as far as prosody is concerned. The case of pronominal DPs is addressed in Hinterhölzl (2009), where a solution in terms of their special licensing conditions is given. DPs consisting of a proper name only, in short, light DPs, can then be taken to follow the spell-out pattern of light pronominal DPs.

To summarize, the correlation between the presence of HFF-effects and the placement of complements within a certain domain (standardly determined by the head complement parameter) can be captured by the same metrically motivated interface condition, if it is assumed that this condition in principle also applies to Specifiers. This conclusion is further supported by weight-effects in the verbal cluster in German to which we turn now.

2.4. Head Final-effects in the German V-domain

There is a peculiar restriction that applies in the V-domain in German. German verb clusters are predominantly left-branching, but right-branching verb clusters are possible as long as the most deeply embedded cluster is left-branching (cf. Hinterhölzl 2006b). A case in question is given in (22a). However, once a right-branching verb cluster is introduced, the verb cluster must also be right-branching at the next level up, as is illustrated by the contrast in (22b) and (22c).[1]

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[1]. Verb cluster formation is argued in Hinterhölzl (2006a) to involve XP-movement of the dependent infinitives into two different functional Specifiers in the V-domain of the selecting verb for licensing purposes. Given that the selecting verb moves into the highest head position in the V-domain, left- and right-branching verb clusters are derived by spelling out the dependent infinitives in the higher or lower Specifier in this account.

(22) a. weil er den Text [muß [lesen können]]
since he the text must read can
'since he must be able to read the text'
b. $^{??}$weiler den Text [[müssen [lesen können]] wird]
since he the text must read can will
'since he will have to be able to read the text'
c. weil er den Text [wird [müssen [lesen können]]]

The contrast between (22b) and (22c) can be analysed as a HF-effect. The heavy syntactic phrase [müssen [lesen können]] has to be spelled out on a right-branch with respect to the auxiliary with which it is going to build a prosodic constituent. The crucial point here is that the dependent infinitives in (22b) occupy a Specifier, to enter into a checking relation with the selecting verb (cf. Hinterhölzl 2006a for the details). Thus, we have a strong case showing that the HFF applies to Specifiers.

The correlate in terms of the head complement parameter of the application of the HFF in the German V-domain is the postverbal realization of CP-complements which arguably are licensed in the V-domain. An empirical generalization concerning extraposition in German is that subject clauses and relative clause extrapose optionally, while complement clauses appear in extraposed position obligatorily. Subject clauses and relative clauses can appear in the middle field, but will preferentially appear postverbally the longer they are. No such length effect appears with complement clauses.

One way to capture this generalisation within the present approach is to assume that subject clauses and relative clauses are licensed in the middle field (in the I-domain) which is weight-insensitive and complement clauses are licensed in the V-domain, which we argued in (22) above to be weight-sensitive, requiring the postverbal Spell-out of CP-complements. Also the extraposition of CP-complements from complex verb clusters, illustrated in (23) can be analyzed as a HF-effect.

(23) a. [sagen dass die Erde rund ist] wird man wohl koennen
say that the earth flat is will one well can
b. *Man wird wohl [sagen dass die Erde rund ist] koennen
c. Man wird wohl sagen koennen [dass die Erde rund ist]

(23a) shows that the selecting verb and its CP-complement form a constituent that can be topicalised in a V2-matrix clause. (23b) shows that the selecting verb and its CP-complement may not appear in this order in a verbal cluster. In the present analysis selecting verb and CP-complement occupy a specifier in the V-domain of the dominating modal verb which is subject to the weight condition, requiring the postverbal Spell-out of the CP-complement. I will refer the reader to Hinterholzl (2006a) for the technical details of extraposition within an LCA-based approach[2].

The data in (22-23), however, is also important in another respect. Given (22-23), we cannot simply assume that the head final filter applies in the nominal domain, but fails to apply in the verbal domain in German. In other words, the application of the HFF in German cannot be determined by a syntactic categorial feature [+/- N], but must be defined phase by phase. In German, the HFF applies in the V-domain, but fails to apply in the I-domain. Thus we can assume that the HFF applies to Specifiers in general but certain Specifiers will be exempted since they happen to occupy a phase in which the mapping between syntax and prosody is weight-insensitive. This is generally the case for Specifiers in the C-domain and also holds for subjects in English, which I will argue below should be analysed as Specifiers in the T-domain, a phase that is projected by the abstract Tense predicate in the clause (cf. Stowell 1996).

In the following section, I will come back to the differential placement of event-related adjuncts. On the basis of the analysis of their syntax, I will outline and motivate a more fine-grained theory of phases that is called for by the above considerations.

3. The licensing of event-related adjuncts

In this section, I will address the question of how the postnominal/postverbal appearance of adjuncts is derived in an LCA-based approach. In this paper, I will only outline the account for adjunct placement in the verbal domain and assume that the same considerations apply to the nominal domain (cf. Cinque 2005 for a similar account). The assumptions made about the definition of phases in this section will become relevant for the rules of prosodic domain formation discussed in detail in section 4 below.

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[2]. In Hinterhölzl (2006) it is proposed that movement of the dependent infinitive into a licensing position in the V-domain of the selecting verb may either pied-pipe or strand a CP-complement. If the dependent infinitive is topicalized also the pied-piping option yields valid output, if the dependent infinitive remains in the verb cluster only the stranding option will yield valid output on the surface (violating the prosodic version of the head final filter).

In the following, I present an account of the syntax of event-related adjuncts that elaborates on the initial proposal by Barbiers (1995). He proposes that the preverbal and postverbal placement of adjuncts is due to vP-intraposition that is motivated by interpretational needs.

In the standard account to modification, it is assumed that adjuncts are adjoined to the maximal category of the head they modify. Therefore, the attachment site of the adjunct is determined by its interpretation (it minimally has to attach to the constituent it modifies). Secondly, the syntactic operation of adjunction is interpreted as set intersection that leads to the identification of the individual variables introduced by adjunct and modified head, as is illustrated in (24).

(24) a. meet in the park
b. $[_{VP} [_{VP} V(e_1)]$ PP $(e_2)]$
c. identification: $e_1 = e_2$ > there is an event e such that meet (e) & in the park (e)

In Cinque's (1999) account, adjuncts are introduced as specifiers of functional heads that are ordered according to a universal hierarchy in the extended projections of the modified head.. Cinque's proposal can be taken to provide an alternative account to the question of how adjuncts are to be attached to the head they modify, but is fails to address the question of how the individual variables of adjunct and modified head are identified.

3.1. Adjuncts and phases

In other words, if we want to dispense with the syntactic operation of adjunction altogether, we must address the question of how an adjunct, being base-generated as the specifier of a functional head is interpreted and how, for instance, the event variable of the verb is identified with the individual variable of an adjunct that sits higher up in the tree in the specifier of a functional head, possibly separated from the verb by various heads dedicated to the licensing of the arguments of the verb.

I would like to make the following proposal. The adjunct introduced as the specifier of a functional head is interpreted as a predicate on the head it is taken to modify in the standard theory. Assuming that every predicate provides a licensing domain for its arguments, introducing an adjunct in the functional skeleton of either CP (or DP) will always involve two functional heads: the one that introduces the adjunct as an additional predicate (called F1 in (25)) and the other that licenses the argument of this predicate (called F2 in (25)). In the course of the derivation vP moves into Spec F2 and the two individual variables are identified via predication, with the vP acting as subject of predication. In this approach, the intuition that event related adjuncts are interpreted as predicates on the verb is represented already in the syntax as a derived subject-predicate relation between vP and adjunct.

(25) [[$_{\text{vP}}$ V (e1)]F2 [PP (e2) F1 ...[t$_{\text{vP}}$]]]

Note that in this approach the vP acts both as a predicate and as a subject. One would expect that a constituent cannot have these very different functions within the same domain. In a phase-based framework, we could assume, however, that the vP obtains these different roles in different phases in the clause. Therefore, I would like to propose that F1 and F2 in (25) constitute projections of a separate phase and are not considered as being part of the extended projection of the verb. F1 introduces an additional predicate in the clause (or DP) that has its own licensing domain, namely F2. In other words, [Spec,F2] can be compared with [Spec,IP] in the clause. vP-intraposition, therefore, has to be considered as a case of A-movement that serves to license the adjunct as a (secondary) predicate (some evidence for the assumption that vP-intraposition is a case of A-movement is given in Hinterhölzl 2009).

That the projections F1 and F2 and their respective Specifiers constitute separate phases follows from the following typology of phases. I propose that the main phases (the CP in the clausal domain and the DP in the nominal domain) comprise the following sub-phases: a predicate domain (roughly the vP in the clause) that introduces a predicate and its arguments, the I-domain, in which the (properties of the) arguments of the predicate are licensed and a C-domain (or completing domain) that embeds the predicate in another clause or in the relevant context. I will call these sub-phases *homorganic,* since they are projected by the same phase predicate. This is illustrated in (26).

(26) Homorganic subphases within the CP
[CP completing domain] [IP licensing domain] [vP predicate domain]

According to this typology, adjuncts comprise a predicate domain and an I-domain but lack a completing domain, which bars them from being embedded like complements. Instead of being embedded they are superimposed in the I-domain of another predicate.

To be licensed event-related adjuncts must enter into a predication relation with the vP in the clause. The subphases projected by an adjunct are non-homorganic with respect to the subphases projected by the verb in the clause. This distinction will become important, when we discuss the role of phases in the rules determining the prosodic composition of syntactic constituents in Section 4.

Since in modern approaches to temporal interpretation (cf. Stowell 1996), Tense is analysed as a predicate that locates the event time of the vP with respect to a given reference time, I propose that this temporal predicate and its projections form their own sub-phases. Since adjuncts do show HF-effects, but subjects like the Specifiers in the C-domain do not show HF-effect, I am assuming that the T-domain, contrary to adjunct-domains, is projected outside of the I-domain of the relevant verb in (27) below.

To summarize, vP-intraposition is triggered by the licensing requirement of adjuncts. The intraposed vP acts as subject of predication. To this end, I have proposed that the I-domain in the clause is interspersed with sub-phases that are projected by event-related adjuncts, as is illustrated in (27).

(27) non-homorganic subphases within CP
[[T-domain] [I-domain [Adjunct-domain] ...[Adjunct-domain]]]

3.2. Against vP-intraposition at LF

The present proposal is similar to Barbiers' (1995) account in proposing that a) vP-intraposition is responsible for postverbal occurrences of event-related adjuncts (cf. (28ab)) and b) that vP-intraposition is semantically triggered. In his account, vP-movement occurs to establish a qualification relation between vP and PP which requires a configuration of mutual immediate c-command between these elements. This is achieved by moving the vP into [Spec,PP], as is illustrated in (28c).

(28) a. Jan heeft [in de tuin] gewerkt
John has in the garden worked
b. Jan heeft gewerkt [in de tuin]
John has worked in the garden
c. Jan heeft [$_{\text{PP}}$ gewerkt [$_{\text{PP}}$ in the tuin]] t$_{\text{vP}}$

If the vP moves into [Spec,PP] in covert syntax, the non-extraposed order in (27a) is derived. In short, in Barbiers' account, vP-movement serves to establish a qualification relation, but this can be done in syntax or by movement at LF. I see one major problem with Barbier's original proposal: in his account, no interpretative differences between intraposed and non-intraposed vP are to be expected.

The problem with this LF-based account is that the intraposed and non-intraposed versions are often not identical in their readings, at least in German. The postverbal PP in (29b) cannot be interpreted as being in the scope of the adverbial *often*, as it has to be interpreted in (29a), and is interpreted obligatorily as a frame adverbial (*when he is in the coffee house, Hans often sits*).

(29) a. weil Hans oft im Kaffeehaus sitzt
since Hans often in the coffee-house sits
b. weil Hans oft sitzt im Kaffeehaus
since Hans often sits in the coffee-house

Second, non-referential adjuncts are generally bad in postverbal position in German and quantified PPs lead to ungrammaticality, as is illustrated in (30). One possible explanation for the ungrammaticality of (30b) is that the quantifier in postverbal position fails to bind the variable in the vP due to lack of c-command (cf. Haider 1993).

(30) a. weil Hans in keinem Garten arbeitet
since Hans in no garden works
b. *weil Hans arbeitet in keinem Garten
since Hans works in no garden

Note that this explanation is not open to Barbiers (1995), since in the relevant qualification relation the PP c-commands the vP in his account. For sure, Barbiers's account must be revised to do justice to the German data, the question is only whether an LF-based account is appropriate for these data in the first place, since the restrictions illustrated in (29-30) are induced prosodically, as is argued in the following subsection and discussed in detail in Hinterhölzl (2009).

3.3. vP-intraposition and the weight-condition

As an alternative to Barbier's account, I propose that vP-intraposition always takes place in overt syntax with the different orders following from an elementary choice in the syntax, namely vP-extraction versus vP pied-piping.

Note that vP-intraposition plus pied-piping of adjuncts will derive the mirror order of event-related adjuncts in English from a universal base order given in (31). A derivation of a sample English sentence is given in (32).

(31) [Temp ... [Loc ...[Manner [SU v [[V DO]]]]]

Based on the universal hierarchy given in (31), the English sentence in (32a) is derived from the base structure in (32b) via successive intraposition. In this derivation, first, the vP containing the verb and its arguments moves in front of the locative PP (32c), then the resulting structure is moved in front of the temporal PP (32d) and in the final step the subject is extracted to be licensed in [Spec,TP] or an appropriate Agreement position above TP, as is indicated in (32e).

(32) a. John visited them in Vienna on Friday
b. […[on Friday [in Vienna [John visited them]]]]
c. […[on Friday [[John visited them] in Vienna t_{VP}]]]
d. […[[John visited them] in Vienna] on Friday]
e. [$_{IP}$ John$_i$ [[[[$_{VP}$ t_i visited them]$_k$ in Vienna t_k]$_j$ on Friday t_j]]

Note that we have tacitly assumed that vP-intraposition pied-pipes the respective adjunct at each step, in order to derive the mirror order from the underlying base order. The base order of these adjuncts is preserved in German, if vP-intraposition strands the respective event-related adjunct at each step and there is an additional operation that moves the entire middle field in front of the verb again.

In Hinterhölzl (2009), it is proposed that the dependency relations between C and T (cf. Chomsky 2005) and between Fin and v (cf. Rizzi 1997) are embodied via XP-movement of TP and AspP into the C-domain in English and German, as is illustrated in (33). First, the extended vP (AspP) is moved into Spec,FinP and then the remaining TP is moved into Spec, MoodP above it.

(33) a. $[_{CP=FP}$ Force $[_{MP}$ Mood $[_{FinP}$ Fin $[_{TP}$ T $[_{AspP}$ V]]]]]
b. $[_{CP=FP}$ Force $[_{MP}$ Mood $[_{FinP}$ $[_{AspP}$ V] Fin $[_{TP}$ T]]]]
c. $[_{CP=FP}$ Force $[_{MP}$ $[_{TP}$ T] M $[_{FinP}$ $[_{AspP}$ V] Fin]]]

The rationale behind these movements is that different speech act (forces) are connected with different verbal moods that determine the situational and temporal anchoring of the event in TP and different verbal moods select different finite and non-finite verbal forms that are expressed in the V-domain.

On its way to the C-domain the extended vP moves into the specifier of (viewpoint) Aspect in the T-domain, as is illustrated in (34). Interface conditions will determine that the extended vP pied-pipes the containing Aspect phrase in English, while in German the extended vP extracts from the Aspect phrase when moving on into the C-domain.

(34) $[_{\text{I-domain}}$ $[_{\text{T-domain}}$ (Spec AgrS) [Spec PRES/PAST [vP Asp]]] $[_{\text{V-domain}}$ t_{vP}]][3]

Given this scenario, we can assume that on its way to the T-domain, the extended vP moves through all the *predication* positions introduced by modifying adjuncts in the middle field. The modifying adjuncts will remain in the original order in preverbal position, if vP is subextracted at each step, since TP-movement will then move the entire middle field anew in front of the extended vP in the C-domain. On the other hand, the adjuncts will appear in the mirror order, that is typical of VO-languages, if the extended vP at each step on its way up to the C-domain pied-pipes the respective functional projections containing the adjuncts. In this case, as is typical for VO-languages, the entire middle field will follow the verb in the C-domain, with only the subject and possibly some higher adverbs being moved via TP-movement to MoodP in front of the verb (phrase) again.

Let us now address the question of which interface condition decides whether the pied-piping or the stranding option is taken. I am assuming a phase-based framework here, where interface conditions evaluate syntactic objects at specific points in the derivation. In particular, I have proposed above that a phase is evaluated at the point of the derivation at which it is licensed.

When the extended vP moves into the licensing domain of an adjunct in the middle field, the adjunct is licensed and the entire phase can be prosodically valuated.

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[3]. In (42), the specifier of the tense predicate contains a referential temporal argument (cf. Stowell 1996) with respect to which the event denoted by vP is situated.

The vP and the adjunct belong to non-homorganic phases and are thus mapped onto separate phonological phrases, as will be proposed in the following section. What is important for the issue of pied-piping/stranding is the fact that the adjunct occupies a right branch, yielding the prosodic pattern in (35). In (35), the metrical values have been annotated on the bracketing derived from the rules of prosodic domain formation outlined in section 4 below.

(35) w(vP) s(adjunct) $_{IP}$]

In a VO-language like English, where the I-domain is sensitive to prosodic weight, a heavy adjunct occupies an optimal position, giving rise to a prosodic preference for pied-piping, while no such preference is predicted for light adjuncts.

In an OV-language like German, on the other hand, placement of adjuncts is weight-insensitive, thus there is no prosodic preference for pied-piping. This may be already sufficient for ruling out pied-piping, given that it is reasonable to assume that per default the minimal phrase containing the attracted feature is targeted by further movement, resulting in a case of vP-extraction that strands the adjuncts at each step.

What is crucial for English is the fact that a heavy adjunct is not stranded by vP-intraposition, otherwise it will be moved by TP-movement into a preverbal position. At the end of the derivation when the phonological phrase of the verb and the phonological phrase of the adjunct are joined within the same prosodic constituent, namely the intonational phrase, the weight condition will apply to stranded adjuncts, permitting only light adjuncts to appear between the subject and the verb.

4. Phases and modes of prosodic domain formation

In this section, I will explore the issue of how this account of weight-sensitivity fits with general assumptions about the interaction between syntax and phonology. I will outline a stress-first based approach to the mapping between syntactic structure and prosodic structure and discuss how a relation-based approach to this mapping can be modified to achieve a stepwise phase-based mapping that goes in parallel with the syntactic computation.

In the literature, we find two basic types of approaches to the syntax-phonology interface: end-based accounts and relation-based account. The accounts differ in the assumption of how much syntactic information is necessary and thus visible in the interface. End-based accounts (cf. Selkirk 1984) assume that it is sufficient for the construction of prosodic constituents, if the boundaries of syntactic constituents are visible at the interface, and define general mapping rules (called rules of alignment) that match syntactic boundaries with prosodic boundaries. This type of approach is not suited for our purposes, since we have seen above that in a weight-sensitive mapping prosody must have access to particulars of syntactic structure.

Relation-based accounts (Nespor & Vogel 1986) assume that prosodic constituents are built around lexical heads on the basis of the relations that these heads entertain to adjacent constituents. This approach serves us better, since it allows us to assume that prosodic composition starts with lexical heads, joining arguments and adjuncts in the course of the derivation, opening up the possibility of applying metrical conditions on the output of this mapping procedure at specific points in the derivation.

Furthermore, they assume that prosody must have access to syntactic structure. For instance, several researchers (Gussenhoven 1983, Krifka 1984) have pointed out that a verb can form a prosodic constituent with an adjacent argument but not with an adjacent adjunct, as is illustrated in (36). As a consequence, main stress falls on the PP-argument in (36a), but on the verb in (36b). In the following, I will use round brackets to indicate phonological phrases, square brackets to indicate intonational phrases and capital letters to indicate main stress.

(36) a. [(weil Hans) (im ZElt blieb)]
since John in the tent remained
b. [(weil Hans) (im Zelt) (RAuchte)]
since John in the tent smoked

If prosody has access to the different syntactic status of complements, specifiers and adjuncts, then specific mapping rules can be formulated for the prosodic composition of a head with these constituents.

Within this general approach, Wagner (2005) proposes that there are two modes of prosodic composition, to account for the differences in prosodic phrasing between German and English, illustrated in (37). While in German the complement of the verb must form a joint prosodic constituent with the verb, verb and complement can either form separate phonological phrases or the verb can restructure with its complement in English. To account for this difference, Wagner proposes two prosodic operations, namely subordination and sister-matching which are defined directionally. In his system, subordination involves obligatory restructuring of the verb into the

phonological phrase of the *preceding* argument only, while sister matching applies to a verb and the argument to its right, allowing for optional restructuring.

(37) a. [(weil Hans) (das Buch las)]
since Hans the book read
b. [(since John) (read the book)]
c. [(since John) (read) (the book)]

In the framework that I have been adopting, complements (internal arguments), subjects and modifiers all occupy Specifiers in the extended projection of the verb in OV-languages, so that prosody cannot make use of these syntactic distinctions. Also directionality parameters like those used by Wagner (2005) should be obviated in an LCA-based system.

As an alternative, I have proposed two modes of prosodic composition which are phase-based and illustrated in (38). Subordination pertains to a lexical head and its arguments – irrespective of their order – that is, to elements that belong to homorganic phases, while coordination applies to a lexical head and a modifier, that is, to elements that belong to non-homorganic phases.

(38) Modes of prosodic composition (cf. Hinterhölzl 2009)
a. subordination: (DP) + V -> ((DP) V)
b. coordination: (PP) & V -> (PP) (V)

While subordination creates a single prosodic constituent, coordination simply maps these phrases into separate prosodic constituents that may be joined into a single prosodic constituent at the sentence level, that is, within one intonational phrase.

It is important to note that subordination as defined in (38a) creates recursive prosodic structures and thus violates the Strict Layer Hypothesis (cf. Selkirk 1984, Nespor and Vogel 1986). However, Ladd (1986), Selkirk (1995), Peperkamp (1997) and Truckenbrodt (1999) provide arguments for the availability of recursive prosodic structures in certain languages.

Here I propose that syntax derives an initial recursive prosodic phrasing which at a later level may be flattened by language specific rules that either delete outer or inner boundaries according to global prosodic parameters like rhythm, length and branchingness of constituents and the like.

For instance, non-branching phonological phrases independently of their phase status undergo phonological restructuring at a later point in normal speech, as is illustrated in (39).

(39) a. dieses alte Haus -> (dieses) (alte) (Haus)
b. (dieses alte Haus)

(39a) indicates the initial prosodic structure based on the phase status of its constituents, while (39b) shows the restructured prosodic constituent comprising a single phonological phrase. In particular, I will show that obligatory restructuring between a verb and its argument is necessitated by metrical restrictions on stress assignment. Adopting a stress-first based account (cf. Ladd 1994), I assume that stress assignment applies after prosodic domain formation and assigns an accent tone to each prosodic constituent. Stress assignment and prosodic phrasing are constrained by the principle in (40).

(40) Stress must fall on the metrically most prominent syllable in a prosodic domain

Prosodic constituents need to be headed. I assume that there are two types of heading procedures, as is illustrated in (41). Intrinsic heading is only possible if two prosodic constituents are asymmetric, as is the case in subordination. Extrinsic heading constitutes a the default procedure in which the members of a prosodic constituent assume the metrical values provided by tree geometry. This means that in the default case the heading procedure is insensitive to the metrical values of subconstituents. In the former case, prosodic constituents can be headed according to the inherent metrical values of its subconstituents. If a head and an argument are combined in a prosodic constituent, the resulting constituent can be intrinsically headed since the combination between a head and a phrase is asymmetric. The head has the status of a prosodic word, while the argument has the status of a phonological phrase. In this case, the argument counts as prosodically strong and the head as prosodically weak[4], as is also illustrated in (42) below.

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[4]. Metrical prominence is a relational property. That the verb is analyzed as metrically weak does not imply that a prosodic constituent comprising only the verb is generally weak (cf. example (33) below). It just means that a head is prosodically weak compared to a (branching) phrasal complement.

(41) a. **Intrinsic heading**:
In the combination of a phonological phrase with a prosodic word, the phonological phrase is metrically strong and the prosodic word is metrically weak[5]
b. **Extrinsic heading (default value):**
In a prosodic constituent (A B), the right-hand member is metrically strong

For German, intrinsic heading must be assumed to derive the correct assignment of main stress, as is illustrated in (42). (42) shows the prosodic phrasing combined with a metrical evaluation after the syntactic derivation is completed. The phrasing of the complementizer is left unspecified in (42). It will restructure with the adjacent DP in a later stage of the derivation, in phonology proper. In (42), the most deeply embedded phonological phrase is intrinsically headed, all other phrases are extrinsically headed according to their position in the tree.

(42) a. weil der Hans der Maria das Buch gab
since John to-Mary the book gave
b. weil (^{w}(der Hans) ^{s}((^{w}(der Maria) ^{s}(^{s}(das Buch) ^{w} gab))))

These are cases of subordination. If an adjunct and a verb are combined two constituents are created which are metrically symmetric, in the sense that there is no intrinsic head determinable. In this case, the default procedure applies assigning main stress to the right-hand prosodic constituent, that is, the verb in German, as is illustrated in (43). The asterisk in (43) indicates the accent tone assigned to each phonological phrase within the intonational phrase of the sentence. The accent tone on the verb is reinforced, since it is associated with the metrically most prominent element of the clause and thus counts as main stress of the sentence.

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[5]. Intrinsic heading is not an ad hoc device to account for stress assignment in German, but is independently needed as a general procedure to account for stress shift in the Germanic languages. Since there is good reason to assume that any focussed constituent can receive main stress in its surface position in German, a stress first based account has to assume that a focussed constituent (a constituent carrying a Focus feature) counts as inherently strong with respect to its prosodic sister.

*   *   *   *
(43) [^{w}(Hans) ^{w}(hat die Maria) ^{w}(in Wien) ^{s}(beSUcht)]
John has the Maria in Vienna visited

The recursive bracketing in (42b) needs to be flattened in phonology proper. This can be achieved by deleting all the outer boundaries but the last one and by restructuring of weakly marked elements with an adjacent phonological phrase, as is illustrated in (44a). The crucial question now becomes what disallows the prosodic phrasing in (44c).

(44) a. (weil der Hans) (der Maria) (das Buch gab)
b. (weil der Hans) (der Maria) (das Buch) gab
c. * (weil der Hans) (der Maria) (das Buch) (gab)

The bracketing of (44c) is derived, if all outer boundaries is are deleted, as is indicated in (44b), and the prosodic word comprising the verb is included in a phonological phrase, as demanded by the SLH. (45) displays the pertinent phrasings of (44a) and (44c) and their metrical values.

*   *   *
(45) a. ^{w}(weil der Hans) ^{w}(der Maria) ^{s}(das Buch gab)
*   *   *   *
b. ^{w}(weil der Hans) ^{w}(der Maria) ^{s}(das Buch) ^{w}(gab)

(45a) constitutes the correct accent pattern for a wide focus sentence. Note that in (45a), the metrical labels correctly determine that main stress falls on the last phonological phrase within the intonational phrase (iP), while in (45b), main stress falls on a constituent that does not occupy the right edge of the iP. Thus, the phrasing in (45b) can be ruled out, since it violates a natural requirement on the headedness of prosodic phrases, given in (46).

(46) Head Peripherality Principle (HPC):
Main stress must fall on the right most phonological phrase within iP

On the other hand, no problem arises in this respect in English, since in either case main stress falls on the metrically strong complement in clause final position. I thus conclude that subordination is not directionally limited, but independent factors, namely the complex interaction between prosodic phrasing, metrical structure and stress assignment, require that the verb in clause final position always forms a prosodic constituent with an adjacent argument.

To conclude, prosodic domain formation can be thought to proceed in a bottom up fashion, in parallel with the syntactic derivation, starting with the lexical heads V, N, A and adverbs and joining arguments, adjuncts according to their phase status. In this stepwise process, guided by phases, prosodic conditions may apply to the current output of the syntactic computation, in the sense that spell-out options as well as pied-piping/stranding options can be fixed, as we have argued for in section 2.3 and section 3 above.

5. Conclusion

In this paper, I have shown that the main word order differences between German and English can be explained by resorting only to prosodic properties. Directionality parameters and adjacency filters can be dispensed with, if prosodic conditions can apply to syntactic structures at various points in the derivation, as defined by a more fine-grained notion of phases. Most importantly, the HFF and the workings of the head complement parameter fall out in this approach as natural extensions of metrical properties of syllable structure onto syntactic structure.

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