

On the interaction between syntax, prosody and information structure

An interface approach to word order developments in Germanic

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In this paper, I argue that the distinction between OV and VO word orders should not be accounted for by a distinction in the base. More specifically, I argue that this distinction can be reduced to the workings of two parallel interface conditions that define the optimal mapping from syntax to PF and from syntax to LF, respectively. I discuss how mixed OV/VO orders in Old High German and Old English can be accounted for in this framework and then lay out the historical conditions and the possible grammatical factors that made English develop into a PF-transparent VO language and German into a scope-transparent OV language.

1. Introduction

The paper investigates the complex interaction between syntax, prosody and information structure and focuses on the proper characterization of mixed word orders in Old English (OE) and Old High German (OHG). While there is widespread agreement that word order in these older stages was crucially determined by information-structural and prosodic properties, the exact nature of the interaction of these factors is still an open question.

This diachronic investigation will be pursued against the background of the minimalist assumption that there are no substantial syntactic parameters (cf. Chomsky 1995, 2005) and that differences between languages can be relegated to differences at the interfaces between syntax and phonology (PF) and/or differences between syntax and semantics/pragmatics (LF). In particular, I will argue against the head-complement parameter (HCP) (cf. Kayne 1994) and show that differences in word order can be explained in terms of interface properties.

To this end, I will outline an alternative system in which prosodic and information-structural conditions fix spell-out options made available in a minimalist system of copy and delete. The paper will be organized in the following way. Sections 2 and 3 are dedicated to the proper characterization of mixed word orders in OHG and OE. Section 4 discusses word order restrictions in the modern varieties of both German and English. Section 5 provides an analysis of head-final effects in German and English. Section 6 discusses basic tenets of the complex interaction between syntax, prosody and information structure. Section 7, finally outlines and discusses two factors that may have contributed to English becoming a strict VO language and to German becoming a strict OV language on the surface.

2. Mixed word orders in Germanic

In this section, I will discuss mixed OV/VO orders in Old High German (OHG) against the background of mixed word orders in Germanic. I will argue against the traditional assumption that German in its oldest accessible stage was a basic OV-language. We find mixed OV/VO word orders, next to Yiddish, as illustrated in (1) taken from Diesing (1997:402), in all older varieties of Germanic. Examples from Old Icelandic (OI) are given in (2) (cf. Hroarsdottir 2001).

- (1) a. *Maks hot nit gegeben Rifken dos bukh*
 Max has not given Rebecca the book
 b. *Maks hot Rifken dos bukh nit gegeben*
 Max has Rebecca the book not given
 ‘Max did not give the book to Rebecca’
- (2) a. *efftir þad þeir höffdu eplid eted*
 after that they had apple-the eaten
 ‘after they had eaten the apple’
 b. *að hann haði edið kjotið*
 that he had eaten meat-the
 ‘that he had eaten the meat’

Mixed word orders pose a challenge to the head–complement parameter, raising the question of what the relevant criteria are for attributing an OV or a VO status to a language. For instance, Diesing (1997) has argued on the basis of the distribution of DP arguments that Yiddish must be considered as a VO language, while Vikner (2001) argued on the basis of the preverbal status of verbal particles that Yiddish should be considered as a basic OV language.

2.1 Mixed word orders in OE

As is well-known, OE displays word orders that are familiar from strict OV languages, as in (3a), as well as word orders that are typical of strict VO languages. Moreover, we find so-called mixed word orders which combine properties from OV languages with VO properties, as illustrated in (3b). In (3b), the infinitival complement precedes the selecting modal verb as is typical of OV languages, but the direct object follows the verbal complex, as is typical for a VO language.

- (3) a. *þæt he his stefne up ahof*
 that he his voice up raised
 ‘that he raised his voice’ (Pintzuk 1991:70)
- b. *þæt ænig mon atellan mæge ealne þone demm*
 that any man relate can all the misery
 ‘that anyone can tell all this misery’ (Pintzuk 1991:36)

Pintzuk (1999) was the first to argue that OE must have had a VO base, since one can find light arguments and light adverbs in postverbal position, which are not subject to extraposition in OV languages like modern German or modern Dutch. To account for the preverbal occurrence of arguments and predicates, Pintzuk (1999) proposed the presence of an additional OV base that is in competition with the VO base (cf. double base hypothesis). Roberts (1997) showed how mixed OV/VO orders in OE can be derived from a unique VO base plus a number of leftward movement operations familiar from modern German and Dutch.

2.2 Mixed word orders in OHG

OHG, like OE, displays a mixed OV/VO word order pattern, as illustrated in (4). Compared to the vivid debate on OE, the discussion on OHG word order has been relatively mute. This is due to the fact that OHG has traditionally been analyzed as an OV language of the modern German type, albeit with a greater degree of extraposition. Furthermore, clear VO features in OHG documents have been attributed to the translation nature of these texts (the earliest texts are translations from the Bible) and hence to Latin influence.

However, the latter assumption can be shown to be unsustainable given that we find VO orders against (5) or independently of (6) the Latin original text.

- (4) a. *thaz then alton giqu&an¹ uúas* (T64, 13a)
 that to-the old ones said was
 ‘that it was told to the old people’

1. In the entire Tatian translation the sign “&” is used as an abbreviation for the string “et”; thus “giqu&an” stands for “giquetan”.

- b. *thaz gibrieuit uuvrđi* al these umbiuerft (T35,9)
that listed was-SUB all this mankind
'that all people were listed'
- (5) a. ut in me *pacem* habeatis
thaz in mir habet sibba (T 290, 8)
so-that in me have-you peace
'such that you have peace in me'
- b. & qui *demonia* habebant
Inti thie thár habēun diuual (T 59, 1)
and those that have demon
'and those ones that were possessed by the devil'
- (6) a. cui nomen simeon
thes namo uuas gihezzan Simeon (T 37)
whose name was named Simeon
'who was called Simeon'
- b. Beati misericordes (T 60, 12)
salige sint thiethar sint miltherze
blessed are those who are mild-hearted
'blessed be those that are good in their hearts'

This aspect is discussed in detail in Hinterhölzl (to appear a), where it is shown on the basis of a careful analysis of the Tatian translation that OHG contains a large number of VO orders which can neither be due to extraposition nor to Latin influence, concluding that OHG had a VO base.

In this paper, I propose – following Roberts (1997) – that OV orders in OHG are derived by leftward movement operations argued to exist in the modern West Germanic languages German and Dutch. I assume that these movement operations are obligatory also in OHG, and propose that word order variation is due to spell-out options (in the copy theory of movement) that are fixed by interface conditions.

3. Prosodic and information-structural conditions on word order

In this section, I will briefly outline the interface conditions thought to fix the spell-out options alluded to in the previous section. There is widespread agreement by now that word order variation in older Germanic is crucially determined by information-structural and prosodic factors (cf. Hroarsdottir 2001 for OI, Hinterhölzl 2010 for OHG, Taylor & Pintzuk 2008 for OE).

3.1 Prosodic/Metrical conditions

In the traditional literature on word order in Germanic, word order variation is argued to be due to stylistic factors. Most prominent among these proposals is Behaghel's law of growing constituents (Behaghel 1932), which states that word order is largely determined by the grammatical/prosodic weight of a constituent. The basis of the law is the generalization given in (7).

- (7) Pronouns and unmodified nouns precede the verb, while modified nouns, PPs and other heavy phrases tend to follow the verb in OI, OE and OHG

This generalization is highly relevant for OHG, since light, non-branching constituents like pronouns and verb particles always precede the verb, while heavy, modified DPs and PPs generally follow the verb. The interested reader is referred to Hinterhölzl (to appear a) for a detailed discussion of this issue. The question that arises at this point is which grammatical condition the empirical generalization in (7) can be related to. In Hinterhölzl (2010), it is argued that Behaghel's law can be (partially) derived from a metrical condition, the effects of which are still visible in the V-domain and in the nominal domain in modern German, under the assumption that the I-domain in OHG was weight-sensitive. The weight condition in (8) will demand that, say, a light argument may be spelled out in the I-domain (preceding the verb), while a heavy branching constituent must be spelled out in the V-domain, that is, in a postverbal position, where a heavy syntactic phrase is defined as given in (9).

- (8) The weight condition (cf. Hinterhölzl 2011):
A specifier in a weight-sensitive domain that constitutes a heavy syntactic constituent must appear on a strong branch with respect to the selecting/modified head
- (9) Heaviness: A syntactic phrase XP counts as heavy if both its head X and the complement of X contain lexical material

According to the weight condition, light elements, in the absence of other interface conditions, can be spelled out either in the I-domain or in the V-domain. To account for the preverbal occurrence of pronouns, verbal particles, and stranded prepositions, I assume the following default rule for the spell-out of constituents that are not subject to any interface conditions, given in (10).

- (10) Preference for the higher copy:
A constituent is spelled out in its checking position rather than in its base position, unless interface conditions demand its spell out in the base position.

3.2 Information-structural conditions

The second type of interface conditions concerns the information-structural value of a constituent and is specified in (11) for OHG. According to (11), discourse-given elements precede the verb, while discourse-new and non-contrastively focused elements tend to follow the verb. Contrastively focused elements, however, occur in a left-adjacent position to the verb. The interested reader is referred to Hinterhölzl (2010) for a detailed discussion of OHG data in favour of the empirical validity of this generalization. In this paper, I would like to concentrate on the theoretical question why something like (11) should hold in a language.

- (11) C background contrast V new information

In Section 6, I will argue that the difference in the spell-out between new and given information follows from an almost iconic relation between metrical properties and IS properties in the mapping between syntactic structure, prosodic structure and information structure. As far as contrastive focus is concerned, Hinterhölzl (2009) proposes that OHG has a preverbal focus position that was specialized to license contrastive focus. In the following section, I will outline the properties that crucially characterize word orders in modern English and German and will motivate the interface condition in (8), argued to hold for OHG and OE. I will argue that this condition is also relevant for word order in Modern English and Modern German.

4. Word order properties of modern German and modern English

The basic word order differences between German and English have traditionally been relegated to the HCP. However, mixed word orders found in OHG, OE and in Yiddish pose a challenge to the HCP, as I have already briefly outlined above. Let me illustrate this issue again with the case of Yiddish. As noted above, Diesing (1997) has argued that Yiddish is a VO language, deriving OV orders with a German type of scrambling operation. Her main argument is that non-specific indefinites (which resist scrambling in German) occur in postverbal position and that hence these positions must be base positions. On the other hand, Vikner (2001) has argued on the basis of the placement of verb particles that Yiddish must constitute an OV language. In Yiddish, verb particles precede the verb (which is typical of OV languages like German), while in clear-cut VO languages verb particles follow the verb, as is the case in English and in the Scandinavian languages. In conclusion, if Yiddish is to be considered as a VO language (in terms of base order), it is of a different (sub-)type than English.

Haider (2010) argues instead that Yiddish is of a third type that combines properties of OV languages with properties of VO languages. According to his assumptions, languages of the third type have an unspecified setting for the HCP. He is constrained

to this assumption, since in his general account of basic word order properties, scrambling is restricted to OV languages. Crucially, Yiddish and the Slavic languages with relative free word order, such as Russian and Polish, should not turn out to involve basic VO order for his account to be correct.

4.1 Scrambling and scope transparency in German and English

Modern German, compared to OHG, has become a language with pure OV surface word order. As is indicated by the position of manner adverbs, arguments in modern German are licensed and spelled out in the I-domain, as illustrated in (12). An important property of the I-domain in German is that it is scope-transparent in the sense that arguments and adjuncts are spelled out in their scope positions, as illustrated in (14) below. Note first that the licensing positions of arguments are interspersed with the projections dedicated to adjunct licensing in a Cinque-type of approach, as illustrated in (13). In (13), which shows the unmarked order for arguments and event-related adjuncts, IO stands for indirect object, DO for direct object and PO for prepositional object. Crucially, the licensing positions for objects are below temporal adverbials, hence the quantified direct object in (14) must be scrambled to a higher position to obtain a licit binding relation with the bound pronoun contained in the temporal adjunct.

- (12) a. **weil Hans sorgfältig ein Buch gelesen hat*
 since Hans carefully a book read has
 b. *weil Hans ein Buch sorgfältig gelesen hat*
 since Hans a book carefully read has
 ‘since John has read the book carefully’
- (13) SU Temp IO DO Loc PO Manner V
- (14) a. **weil Maria an seinem_i Geburtstag jeden_i traf*
 since Mara on his birthday everyone met
 b. *weil Maria jeden_i an seinem_i Geburtstag traf*
 since Maria everyone on his birthday met
 c. John met every girl on her birthday

If adjuncts are base-generated outside the verbal domain also in English (see Hinterhölzl 2009 for arguments against a Larsonian approach to modification), then the parallel binding effect, illustrated in (14c) requires also movement of the object to a position above the temporal adjunct in the I-domain. The traditional assumption is that quantified expressions undergo Quantifier Raising (QR) to IP in English (cf. May 1985). Note, however, that QR of the direct object in (14c) would lead to a Weak Crossover violation, contrary to fact.

In alternative to a Larsonian approach to modification, I propose that the direct object in (14c) undergoes (licensing movement and) scrambling, parallel to the movement in German (14b), but spells out these copies in the v-domain. That this analysis is correct is shown by the contrast ~~between~~ vP-topicalization between German and English. In German, where scope relations are overtly displayed in the I-domain, a direct object that is pied-piped by vP-topicalization may not take scope over and bind a pronoun within a temporal adjuncts, as is illustrated in (15a). The direct object either remains below the temporal adjunct and can thus be pied-piped by vP-topicalization stranding the adverbial in the I-domain, as in (15b). In this case, however, no binding relation obtains between the quantified object and the pronoun contained in the adjunct. Or it can undergo scrambling to take scope over and bind the pronoun, but may then not be affected by an operation of vP-topicalization that strands the adjunct, as illustrated in (15c). If scope-taking scrambling operations in English spell-out the lower copy in the vP, then we expect that a direct object can (and must) undergo vP-topicalization with the verb by virtue of its PF copy and at the same time can take scope over an adverbial in the I-domain by virtue of the unspelled-out copy in the scope position at LF. This prediction is fulfilled, as is shown by the parallel example, discussed in Pesetsky (2000), in (15d).

- (15) a. *[*jedes Mädchen getroffen*] *hat Hans an ihrem Geburtstag*
 every girl met has Hans on her birthday
 b. [*jedes Mädchen getroffen*] *hat Hans an ihrem Geburtstag*
 every girl met has Hans on her birthday
 c. *getroffen hat Hans jedes Mädchen an ihrem Geburtstag*
 met has Hans every girl on her birthday
 d. ... and [meet every girl] John did on her birthday

To summarize, arguments and adjuncts in the German I-domain are spelled out in their scope position, suggesting the definition of scope transparency as given in (16). In English, on the other hand, arguments do not display their scope relations overtly. Our proposal is that this is so since arguments are spelled out in the v-domain in English. Furthermore, I have argued that binding into adjuncts requires the assumption of (silent)² scrambling in English, discarding the claim of Haider (2010) that basic OV order and scrambling derive from a common underlying parameter.

2. Since in English the lower copy is spelled-out, the scrambling operation, though visible and interpretable at LF, is invisible at PF. For this reason, it has been called silent scrambling in Hinterhölzl (2002).

- (16) Scope Transparency (cf. Bobaljik & Wurmbrand 2012; Hinterhölzl to appear a):
 If *a* takes scope over *b* the spell-out copy of *a* must c-command the spell-out copy of *b*

4.2 The HCP and the placement of event-related adjuncts

Time, place and manner adjuncts occur preverbally in German, but postverbally in the exact mirror order in English, as illustrated in (17).

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

In the standard account of modification in terms of leftward or rightward adjunction, the direction of adjunction must be assumed to correlate with the setting of the HCP, raising the question of which property connects the HCP with the default placement of event-related adjuncts. Ideally, there should be a common underlying property from which the placement of both complements and event-related adjuncts is derived. The proposal that I would like to make in this paper is that the placement of arguments and event-related adjuncts in English and German follows in part from a unique condition in which prosodic weight plays a crucial role.

Another difference between a VO language like English and an OV language like German concerns the fact these event related adjuncts in English are subject to a restriction that is absent in German, as the contrast in (18) and (19) indicates.

- (18) a. John (more) often (*than Peter) read the book
 b. John (very) carefully read the book
 c. *John with (great) care read the book
- (19) a. Hans hat das Buch öfter (als der Peter) gelesen
 b. Hans hat das Buch sehr sorgfältig gelesen
 c. Hans hat das Buch mit großer Sorgfalt gelesen

The data in (18), in particular the contrast between (18b) and (18c), 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 (17) and (18).

The restrictions illustrated in (18) are reminiscent of head-final effects (henceforth HF-effects), first discussed by Emonds (1976) and Williams (1982). In the following section, I will discuss HF-effects in further detail and argue that these effects as well as the placement of event-related adjuncts can be derived from a single condition that applies in the syntax-prosody interface.

5. HF-effects in German and English

The data in (18) can be captured by a generalized version of the head-final filter (HFF), given in (21) below. On the basis of contrasts as in (20), Williams (1982) proposed a condition which requires that the head of a prenominal modifier be adjacent to the (modified) noun.

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

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

5.1 HF-effects in the nominal domain in German

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 illustrated in (22a–c). Furthermore, the complement of an adjective cannot follow the head (cf. the contrast between (23a–c)), while no such restriction applies in the clausal domain (23d).

- (22) a. die Überreichung der Oscars in L.A. letzten Sommer
 b. the presenting (of) the Oscars in L.A. last summer
 c. die Überreichung der Oscars letzten Sommer in L.A.
 d. the presenting of the Oscars last summer in L.A.
- (23) a. *der [auf seine Kinder stolze] Vater*
 the of his children proud+Agr father
 ‘the father proud of his children’
 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
 ‘since he is proud of his children’

Given that nominal phrases in German are head-initial, the data in (22–23) 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 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.

5.2 HF-effects in the verbal domain in German

In this section, I argue that the application of the HFF is not restricted to the nominal domain in German, but also applies in the 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 2006). A case in question is (24a). However, once a right-branching verb cluster is introduced, the verb cluster must also be right-branching at the next level up, as illustrated in (24b) and (24c).³

- (24) 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. **weil er den ext [[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]]]*
 since he the text will must read can
 ‘since he will have to be able to read the text’

The contrast between (24b) and (24c) can be analyzed as an HF-effect. The syntactic phrase [müssen [lesen können]] to the left of the selecting auxiliary *wird* is not head-final. The crucial point here is that the dependent infinitives in (24b) occupy a specifier, to enter into a checking relation with the selecting verb (cf. Hinterhölzl 2006 for the details). Thus, we have a strong case showing that the HFF applies to specifiers.

The picture that we have arrived at is rather puzzling. The HFF was initially proposed as a condition on (left)-adjunction. In this section, I have argued that it also applies to bona fide specifiers in German. In the following section, we will see that that the specifier of T and the specifiers of the C-domain in English are exempt from the HFF.

The solution to this problem is that the HFF is phase-based. In Section 5.4, I will argue that the HFF can be reduced to a metrical condition on the mapping between syntax and prosody and that this mapping is crucially sensitive to phases.

3. Verb cluster formation is argued in Hinterhölzl (2006) 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.

5.3 The HFF as a syntactic condition

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. First note that the HFF does not apply to subjects (i.e. specifiers of I) as in (25a), intonationally detached DP and PP frames (cf. 25b) and specifiers of other functional heads in the C-domain (cf. 25c).

- (25) a. [Students [of linguistics]] read Chomsky a lot
 b. [On [Tuesday evening]] I will take Mary out 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 cross-linguistic application. As we have seen in the previous section (cf. Examples (18) and (19) 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 categorically head-initial language.

Furthermore, we have seen in the previous section (cf. the data in (23–24)) that we cannot simply assume that the HFF 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 [\pm N], but must be defined domain by domain. 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 that certain specifiers will be exempted since they happen to occupy a domain in which the HFF does not apply.

This raises some doubts on whether HF-effects should be treated as purely syntactic effects. Furthermore, it is important to note that if we adopt Cinque's 1999 account 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 (21), as we have seen above. At this point we hit a bifurcation. We 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 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 (21), 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).

5.4 The HFF as a prosodic condition

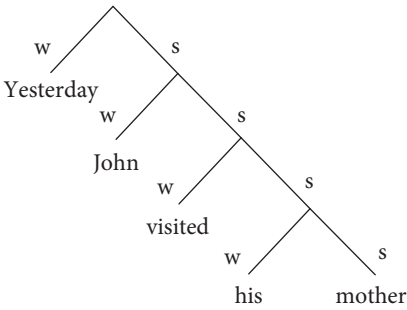
In this section, I would like to motivate why HF-effects should be treated as prosodic in nature. One argument comes from the observation that HF-effects in English disappear, if the adjunct is epenthetic, constituting a separate intonational domain, as is indicated by the comma intonation in (28b).

- (28) 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. In Hinterhölzl (to appear a), it is argued that HF-effects derive from a metrical restriction that applies in the mapping between syntactic structure and prosodic structure. The general idea is that there are weight effects in prosodic domain formation of clauses as there are weight effects in prosodic domain formation of words, as discussed in Halle and Vergnaud (1987). Like a heavy syllable cannot occupy a recessive branch, if prosodic word formation is weight-sensitive, a heavy syntactic phrase must occupy a dominant branch in the prosodic structure that is mapped from syntactic structure in a weight-sensitive domain.

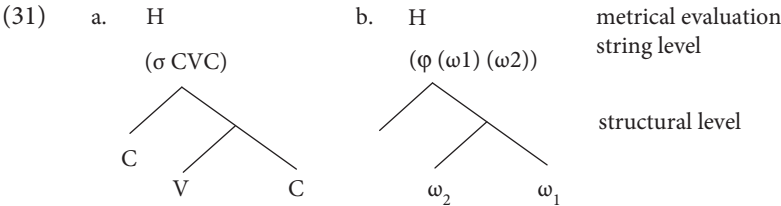
In fact, the metrical evaluation of a binary branching, anti-symmetric tree which assigns the metrical label strong (s) to the right branch at each level immediately makes clear why something like the weight condition should apply to adjuncts to the left, and why the effect is dismissed if the adjunct appears to the right of modified head. In such a metrical tree, constituents to the left of the verb sit on a weak branch, while constituents to the right of the verb sit on a strong branch, as illustrated for a simple English sentence in (29). The resultant condition, given in (30), is motivated in detail in Hinterhölzl (to appear a).

(29) Yesterday John visited his mother



(30) Weight sensitivity:
A heavy syntactic phrase contained in a weight-sensitive domain must occupy a strong branch in prosodic structure

At this point, the question arises of when a syntactic phrase counts as heavy in prosodic structure. I propose that there is the following parallelism between syntactic structure and metrical structure (formerly only understood as pertaining to syllables), as is illustrated in (31). Metrically evaluating the string of sounds (σ CVC) means determining on the basis of the structural level that the syllable is bimoraic (since both nucleus and coda are filled) and hence counts as heavy (H). Metrically evaluating the string (φ proud of his mother) means determining on the basis of the structural level that the phrase is head branching, since both head and complement are filled, and thus counts as heavy (H). These considerations suggest the definition of syntactic phrase as given in (32).



(32) A syntactic phrase XP counts as heavy if both its head X and the complement of X contain lexical material

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 is now how the assumptions that I have made about the interaction between syntax and prosody fit into the general picture that has been drawn about the interface between syntax and PF in the literature. We turn to this question in Section 6 below. In the following section, I will discuss whether VO orders can be derived from the weight condition.

5.5 The weight condition and word order restrictions

The weight condition in (30) above is phrased in such a general way that it needs to be restricted properly to exclude its application from subjects and from specifiers in the C-domain. An elegant solution to the problem is the application of the notion of a phase. Chomsky (2001) proposes that the interaction between the syntactic component and the interfaces is phase-based. Whenever the syntactic computation completes a phase the result – in technical terms the complement domain of the phase head – is shipped to the interfaces for interpretation. Chomsky (2001) proposes that the clause is divided in three phases: the v-domain, the I-domain and the C-domain.

This proposal comes in handy since we have seen above that the HFF applies in the English I-domain, in the German v-domain, but fails to apply in the German I-domain. Moreover, the HFF does not seem to apply in the C-domain in either of the two languages, suggesting that the application of interface conditions like the HFF is phase-based in the sense that it may characterize the mapping of syntactic structure onto – say – prosodic structure in a particular phase of the clause but not in another.

In Hinterhölzl (2009), it is proposed that event-related adjuncts and tense *qua* their nature of being predicates on the event argument of the verb form separate phases from the phases projected by the verb itself. In particular, it is proposed that the application of interface conditions is phase-based with the T-domain and C-domain being exempt from the weight-condition. Furthermore, it is argued that the placement of event-related adjuncts in English is derived from an underlying universal order that corresponds to the unmarked order in German order via vP-intrapolation (as proposed by Barbiers 1995) and by pied-piping the adjuncts, the latter being requested by the weight condition which applies in the English I-domain, allowing only light adjuncts in the preverbal domain in English.

The weight condition will also account for the postnominal spell-out of arguments and adjuncts in DPs in German and English, since they minimally comprise a (case assigning) preposition and a noun, but cannot fully explain the placement of verbal arguments in English: according to the weight condition, DP-arguments which minimally comprise a determiner and a noun need to be spelled out in the v-domain in English, but the condition is silent as far as pronouns and (unmodified) names are concerned. The latter should be able to appear in the postverbal or the preverbal domain in English.

This might just be a small issue, but note that the weight condition does not hold in the Russian I-domain, where preverbal heavy adjuncts are admitted, but arguments, when focused, generally follow the verb: Functionalists have pointed out that mixed word orders in Czech, Polish and Russian are governed by the principle *theme precedes rheme* (cf. Firbas 1992). Siewierska and Uhlirová (1998) provide an overview of

word order properties in the Slavic languages and show that in unmarked word orders given constituents precede the verb, while focused constituents follow it.⁴ Thus we have to look for an interface condition that explains these facts in the absence of the weight condition. In the following section, I propose that the postverbal placement of constituents representing new information focus follows from a quasi iconic relationship between information structure categories and metrical categories in the mapping between syntactic structure and prosodic structure.

6. On the mapping between syntactic structure and prosodic structure

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.

Since we have seen above that prosodic domain formation is sensitive to the metrical properties of syntactic constituents, a stress-first based approach which assumes that accent placement is determined by the metrical properties of prosodic constituents serves us well. Thus I will adopt this approach without further discussion (cf. Ladd 1996 for arguments against an accent-first based approach along the lines of Selkirk 1995).

6.1 Prosodic domain formation in a phase-based approach

In the literature, we find two basic types of approaches to deriving prosodic constituents from syntactic structure: end-based accounts and relation-based accounts. 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

4. With unmarked word order here and in other places in this paper, I understand a word order that is appropriate in an out of the blue situation, signified by a discourse question of the type “What’s new? What has happened?”. In this way, word orders that are appropriate or called for in discourse situations that involve specific presuppositions, emphatic or contrastive focus (which in many languages trigger movement to special positions) are excluded as marked word orders.

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 1984; 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 (33). As a consequence, main stress (which is generally placed on the last prosodic constituent within the intonational phrase) falls on the PP-argument in (33a), but on the verb in (33b). In the following, I will use round brackets to indicate phonological phrases, square brackets to indicate intonational phrases and underlining (of the prosodic word) to indicate main stress.

- (33) a. [(*weil* Hans) (*im* Zelt *blieb*)]
 since John in the tent remained
 'since John remained in the tent'
- b. [(*weil* Hans) (*im* Zelt) (rauchte)]
 since John in the tent smoked
 'since John smoked in the tent'

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 (34). 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.

- (34) a. [(*weil* Hans) (*das* Buch *las*)]
 since Hans the book read
 'since John read the book'

- b. [(since John) (read the book)]
- c. [(since John) (read) (the book)]

In the framework that I have adopted, 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 anti-symmetric syntax.⁵

As an alternative, I propose two modes of prosodic composition which are phase-based and illustrated in (35). Subordination pertains to a lexical head and its arguments – irrespective of their order – that is, to elements that belong to the same phase, while coordination applies to a lexical head and a modifier, that is, to elements that belong to separate phases. Thus, it is the phase status that determines the mode of prosodic composition in this approach.

- (35) Modes of prosodic composition
- 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 (35a) creates recursive prosodic structures and thus violates the Strict Layer Hypothesis (cf. Selkirk 1984; Nespor & Vogel 1986). However, Ladd (1986), Selkirk (1995), Peperkamp (1997) and Truckenbrodt (1995, 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.

Prosodic constituents need to be headed. I assume that there are two types of procedures that determine the head of a prosodic constituent: extrinsic heading and intrinsic heading, as illustrated in (36).

- (36) a. Extrinsic heading (default value):
In prosodic composition, the right-hand member is metrically strong

5. In Hinterhölzl (2012) it is shown that obligatory restructuring between a verb and its argument in German is necessitated by metrical restrictions on stress assignment.

b. Intrinsic heading:

In the combination of two prosodic constituents that differ in their prosodic status, the constituent that is higher in the prosodic hierarchy⁶ is assigned the metrical value strong⁷

Extrinsic heading constitutes 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.

Intrinsic heading is only possible if two prosodic constituents are asymmetric, as is the case in subordination when the first argument is joined with its selecting head. In this case, a prosodic constituent can be headed according to the inherent metrical values of its subconstituents. Subordination of the first argument with its head is asymmetric, assuming that prosodic domain formation proceeds in a phase-based fashion. Given that a DP-argument constitutes a phase that has been completed at the point of the derivation when it is merged with the verb, it will have been prosodically evaluated and in the regular case will have been mapped onto a phonological phrase, while the verb corresponds to a phonological word. In this case, the phonological phrase counts as inherently metrically strong, with the verb being assigned the metrical value weak in consequence.⁸

For German, intrinsic heading must be assumed to derive the correct assignment of main stress to the direct object, as discussed with respect to Example (33) above. Intrinsic heading constitutes another case – in addition to weight sensitivity – where the prosodic mapping of a syntactic constituent is sensitive to a metrical property of a subconstituent.

6. Here I refer to the prosodic hierarchy embodied in the Strict Layer Hypothesis (SLH) by Selkirk (1984), consisting of the prosodic categories syllable, foot, prosodic word, phonological phrase, intonational phrase and utterance phrase. According to the SLH, only prosodic constituents of the same level can be combined. In this case, the head of the combined prosodic category is determined by extrinsic heading. But exceptions to the SLH exist. For instance in the case of clitics, as in the English sentence “I hit’im (I hit him)”, a phonological word is combined with a syllable, with the head of the combined metrical category being the phonological word.

7. I will refer to this effect as strength-sensitivity parallel to the case of weakness-sensitivity triggered by discourse-given constituents to be discussed in the following section.

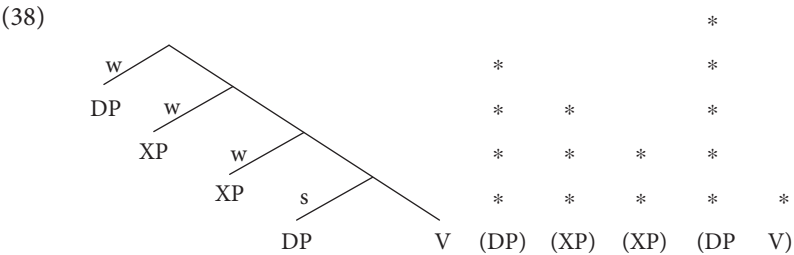
8. Metrical prominence is a relational property. That the verb is analyzed as metrically weak does not imply that a prosodic constituent comprising only the verb is generally weak (cf. Example (33b) above). It just means that a head is prosodically weak compared to a (branching) phrasal complement.

6.2 Focus, prominence and rules of accent placement

Adopting a stress-first based account (cf. Ladd 1996), I assume that accent assignment applies after prosodic domain formation and assigns an accent tone to each prosodic constituent. In particular, I assume that a word-level accent is assigned to each prosodic word, a phrase-level accent is assigned to each phonological phrase and a sentence accent, usually called the nuclear accent, is assigned to each intonational phrase of the utterance, according to the principle in (37).

- (37) The accent must fall on the metrically most prominent syllable in a prosodic domain

If we assume along the lines of Halle and Vergnaud (1987) that during prosodic evaluation the labelled tree is converted into a bracketed grid representation, the relative strengths of the several accents in the clause are derived, as illustrated in (38) for a putative German sentence comprising a subject DP, two adjunct XPs and a direct object DP and the verb.



However, prosodic structure is not only determined by and derived from syntactic structure, as illustrated in (38), but it is also crucially determined by information structure (IS). In particular, the following condition must be assumed for the mapping between accent and focus in intonational languages like German and English.

- (39) The focused constituent must contain the most prominent accent in the clause

In a stress-based approach, in which the relative strength of an accent depends on its metrical value in the clause, this implies that there exists a mapping relation between metrical constituents and IS-categories. Since it is observed that given elements in the languages under discussion are typically prosodically weak and often destressed, I will propose the interface condition in (40).

- (40) G-Transparency (PF-transparency):
A given constituent must occupy a weak position in prosodic structure

There are basically two ways of satisfying the condition in (40). (A) A given argument moves out of its postverbal (strong) base position and is spelled out in a preverbal position, which necessarily counts as metrically weak. This derives the strong tendency in languages to realize given elements to the left of the verb. (B) The default value assigned in prosodic composition to a given postverbal constituent is overwritten by projecting its intrinsic prosodic value, namely weak, in prosodic composition. We have a case of deaccenting in situ, which in the present system represents the third case of sensitivity to inherent metrical properties in prosodic domain formation, as illustrated in (41) and defined in (42) below.

The empirical result of this option is that stress and main accent will shift locally to the left-hand prosodic sister of a given constituent, as illustrated in (41). In (41), main stress falls on the verb, as is indicated by underlining. The respective prosodic constituents have the metrical values given in (41B). In (41), the verb is assigned the metrical value *strong*, since its prosodic sister projects its intrinsic value *weak* according to its discourse-given status.

- (41) A: Did Peter visit his sister?
 B: No, John wrote to his sister
 ((John)^w s(^s wrote^w (to his sister)))
- (42) Weakness sensitivity:
 A given constituent projects its inherent metrical value *weak* (w)
 independently of its metrical position in the structure

Parallel to the condition in (40), we can assume an interface condition for elements representing new information, as given in (43).

- (43) F-Transparency (PF-transparency):
 A constituent representing new information must occupy a strong position
 in prosodic structure

There are basically two ways of satisfying the condition in (43). First, a focused constituent is spelled out in its base position in the vP. Since prosodic domain formation starts with the verb, constituents joined to the left side of (the prosodic constituent containing) the verb occupy a weak branch, while constituents joined to the right of (the prosodic constituent containing) the verb occupy a strong branch, implying that constituents representing new information focus should be realized to the right of the verb.

The second option consists in the insertion of a functional head in the syntax, typically called Focus and mostly found in the left periphery of the clause, which in addition to its LF-function of introducing alternative values for an open proposition (cf. Rooth 1992; Krifka 2008) assigns the metrical value strong to its specifier (the focused constituent) and the metrical value weak to its complement, representing the presupposition

of the utterance. In many languages, this strategy is reserved for (narrow) emphatic or contrastive focus, while information focus is often unmarked and can be handled most naturally by an interface condition like (43) in the present account.

To summarize, prosodic constituents and their metrical values are derived in a phase-based fashion from syntactic structure. Accent assignment is crucially determined both by metrical properties and by information-structural properties, necessitating a complex mapping between metrical categories and IS-categories. The mapping of prosodic structure from syntactic structure follows from tree-geometrically defined default values, but may in three ways depend on the intrinsic values of prosodic constituents. These cases were called weight sensitivity (a heavy constituent must occupy a strong branch), strength sensitivity (a prosodic phrase in composition with a prosodic word receives the value *strong*) and weakness sensitivity (a given constituent receives the metrical value *weak*).

6.3 On the relation between syntax, IS and LF

In the literature, we find two opinions about how IS-categories are made visible in the grammar. Most researchers assume that this is done via PF-properties, since IS-categories in many languages are signalled by specific pitch accents or the lack of it, or via means of alternative prosodic phrasing. In the German tradition, there is an alternative approach which assumes that IS-categories are primarily signalled by scopal relations. This view is most clearly expressed by the structured meaning approach by Krifka (1984), but is also evident in the work of Diesing (1992) and Kratzer (1995), who assume that different DP-interpretations are signalled in that these constituents are mapped from specific syntactic domains onto LF. In the structured meaning approach, it is assumed that background information is mapped outside of the scope domain of the assertion, marked by an Assertion operator. Furthermore, Jacobs (1984) proposed that also information focus is bound to a (silent) focus operator, parallel to the association with focus of overt operators like *only*, *even* and others. He identified this silent focus operator with the Assertion operator in the clause.

In fact, if we look at the distribution of given arguments in German, then their positioning is only insufficiently described by the restriction in (40) in German. Weak pronouns and DPs not only precede the verb but also precede sentential adverbs and negation in German, as illustrated in (44).

- (44) a. *weil der Hans sie sicherlich besuchen wird*
 since Hans her certainly visit will
 ‘since Hans will certainly visit her’
 b. *weil der Hans die Maria nicht besucht hat*
 since Hans-NOM Maria-ACC not visited has
 ‘since Hans has not visited Maria’

Assuming that these adverbs and (sentential) negation mark the boundary of the I-domain, it follows that given constituents occupy the C-domain in German. Let us assume that if the Assertion operator occupies the lowest position in the C-domain (presumably FinP in the system of Rizzi 1997), given information scopes out of the agreement domain of this operator. The preverbal placement of new information in German can be explained in the following way. I propose that constituents marked with the F-feature are interpreted by entering into an Agree relation with the Assertion operator. I assume that this Agree relation is subject to the Phase Impenetrability Condition, allowing for the establishment of this relation with a constituent in the I-domain, but not in the v-domain (which constitutes a strong phase in Chomsky 1995). Under these assumptions, referential arguments like quantified arguments can be taken to be spelled out in their respective scope position, that is, in the position in which they are interpreted at LF.

In conclusion, German is an LF-transparent language, in the sense that quantifier scope and IS-scope are indicated in (the overt) syntactic structure. This means that G- and F-transparency can be achieved in two ways: via scope relations in the overt syntax (cf. 45), as in German, or via metrical relations (only), as in English.⁹ This will become important when we discuss word order change in the following section.

- (45) a. F-Transparency (LF-Transparency):
A focused constituent must be spelled out in the Agreement domain of the Assertion operator
- b. G-Transparency (LF-Transparency):
A given constituent must be spelled out outside the Agreement domain of the Assertion operator

The fact that IS-categories are already visible via scope relations in the overt syntax does not mean, however, that IS-categories in German do not obey PF-transparency. German possesses a strong preverbal position due to intrinsic heading of the first prosodic constituent formed with the verb. Thus, focused constituents must occupy the verb-adjacent position, with the operation of scrambling moving potentially intervening given constituents out of the way.

9. At LF, of course, given DPs will be interpreted in the C-domain and DPs constituting new information will be interpreted in the I-domain also in English. The interpretational effect of a DP in the Agreement domain of the Assertion operator is to add a new discourse referent to the Common Ground, while the interpretational effect of a DP outside of the scope of the Assertion operator leads to the retrieval of an already established discourse referent with the relevant features from the Common Ground (cf. Hinterhölzl, ~~to appear b~~). But these DP-interpretations do not have any influence on their spell-out in (modern) English.

In English, on the other hand, heavy and focused arguments must be spelled out postverbally according to the weight condition and F-transparency, respectively. Light given arguments, on the other hand, are free to be spelled out in the I-domain or in the v-domain, and according to the principle for preference of the higher copy in (10) above should be spelled out in the I-domain. Note that modern English allows for de-accenting in situ in order to make visible the discourse-given status of a constituent. In the following section, I will present the possible diachronic source of this property of modern English, when I discuss in some detail the changes that occurred between Old English and Early Middle English.

7. Word order change in English and German

In this section, I will discuss the changes that may have been crucial in driving English into becoming a pure VO language and German into becoming a pure OV language. It is interesting to note that both languages rather quickly lose their mixed word order status. The diachronic change in the history of English is standardly described as a change from a double OV/VO grammar to a (single) VO grammar due to grammar competition (cf. [references](#)). Since I dispense with the HCP, the pertinent changes must be described in terms of changes in the interfaces. Below, I will argue that these changes involve changes in the expression of information-structural categories triggered by external factors. The factors that I will investigate in more detail are the effects on word order of (a) the grammaticalization of the definite determiner in OHG and Middle English (ME), and (b) the reanalysis of the preverbal focus position in the history of German.

7.1 Word order variation in OE and OHG: Point of departure

The standard explanation of word order variation in OE has been the double base hypothesis, that is, the simultaneous presence of an OV and a VO grammar. A VO base is necessary to explain the postverbal occurrences of pronouns, simple adverbs and particles, since light elements resist extraposition in the modern Germanic OV languages like German and Dutch. An OV base is necessary in the standard account, since the occurrence of I-final clauses and preverbal particles is not evidenced in the modern Germanic VO languages like English and the Scandinavian languages.

In this paper, I have outlined a different approach in which different word orders are derived from a unique VO base in terms of leftward (licensing) movement plus variable spell-out determined by prosodic and information-structural conditions. The empirical generalizations, discussed in Section 2 above, are repeated for the sake of convenience in (46). In Sections 4–6, I argued that the generalizations in (46) follow from three grammatical conditions: the weight condition, F-transparency and G-transparency.

- (46) a. Light elements precede the verb; heavy elements follow it (metrical restriction)
 b. background elements precede the verb; new information focus follows it (IS-restrictions)

Note that most of the data in both OE and OHG can be explained by either the metrical condition or by the IS-conditions alone. For the sake of argumentation, I will assume that all three conditions held in OE and OHG. In particular, I assume that the I-domain was weight-sensitive in OE and in OHG.

7.2 The grammaticalization of the definite determiner

Let us first discuss the effects that the grammaticalization of the definite determiner may have in such a weight-sensitive system. In the present approach, it is plausible to assume that the grammaticalization of the definite determiner lead to a major change in the prosodic mapping in the history of English and German.

It is well known that definite DPs are first introduced preverbally in both English and German. This can be made sense of in terms of their IS-status as well as in terms of their prosodic weight. Since they are discourse-anaphoric in nature, we expect definite DPs to appear preverbally in a system like OE and OHG (cf. the condition in (46b)).

The original structure that gets grammaticalized involves a demonstrative DP in the specifier of the discourse-anaphoric noun phrase, and counts as prosodically light according to the definition in (32) above. Thus, discourse-anaphoric DPs can appear in the preverbal domain in a grammatical system in the I-domain of which the weight condition applies.

Note, however, that definite DPs will count as prosodically heavy as soon as the definite determiner is fully grammaticalized and reanalyzed as the head of the DP. In this scenario, there are two conceivable reactions. Either word order is interpreted as mainly due to PF-transparency, and heavy DPs are realized postverbally in accordance with the weight condition (the English path) or word order is interpreted as mainly due to LF-transparency with the weight condition being discarded in the I-domain (the German path). In the following section, I will try to shed some light on the trajectory of these paths, by interpreting data about the pertinent changes reported in the literature. Note first, however, that if weight sensitivity is preserved, as is arguably the case in the history of English, G-transparency of given constituents can only be maintained if the prosodic mapping becomes weakness-sensitive (cf. (42) above), that is to say, if the language allows for de-accentuation in situ of discourse-given but heavy constituents. Secondly, also note that once definite DPs are spelled-out in the v-domain, their overt (non-silent) scrambling into higher positions in the clause becomes impossible due to minimality or the Phase

Impenetrability Condition in minimalism, as is illustrated in (47). In (47), underlining is used to indicate the spelled-out copy in the respective phases, and D stands for the category pronoun.

- (47) a. [C DP [I DP [v V DP]]]
 b. [C D [I D [v V D]]]

If a DP argument (containing a definite determiner) is moved into the I-domain for licensing purposes and is spelled out in the v-domain due to the weight condition, a further operation of scrambling can only target (the closest) silent copy but not the pronounced copy in the vP. Thus the prediction is that a grammatical system that preserves the weight condition in the I-domain will lose overt (PF-visible) scrambling of heavy DPs, but may preserve overt scrambling of (non-heavy) pronouns. In the following section, I will discuss to which extent these predictions are fulfilled in the successive period, namely in the texts of Early Middle English (EME).

7.3 Word order variation in Early Middle English

The data and facts presented in this section are taken from the corpus study of Kroch and Taylor (2000), henceforth K&T. In their paper, K&T provide a thorough statistical analysis of word order patterns of five ME prose texts from the early 13th century: three from the West Midland area and two from the south-eastern area. They are concerned with determining the base order(s) of these texts, scanning them for reliable diagnostics for VO base order and OV base order. They find that all texts show reliable evidence of basic VO order, and then correctly observe that superficial OV orders are not a reliable indicator for basic OV order, since OV orders can be derived from underlying VO order plus leftward movement in a grammar that allows for scrambling of pronominal, nominal and negative or quantified objects. Thus they try to estimate the respective frequencies of these three types of scrambling operations, arguing that the remaining numbers of superficial OV orders must then be interpreted as due to basic OV order.

Interestingly, they find out that there are big differences between the three types of scrambling operations. While scrambling of pronouns ranges between 47% in West Midland texts and 84% in south-eastern texts and 15%–20% of negative and quantified objects in both text groups undergo scrambling, the frequency of scrambled referential DPs is surprisingly low in the two groups of texts: only 5% of non-quantified DPs undergo scrambling. Why should this be so?

First of all, why should there be a difference in scrambling between quantified and non-quantified DPs? Our determiner hypothesis provides a possible answer to this question. Referential DPs that contain a definite article count as metrically heavy and must be spelled out in the v-domain according to the weight condition, allowing only light DPs to be spelled out in the I-domain and to undergo scrambling. What about negative and quantified objects? If we assume that most quantifiers constitute

XPs rather than heads, then quantified noun phrases may freely undergo scrambling according to their scopal properties. I will have to leave this issue for further research.

Even more interesting for our purposes are the large differences in pronoun scrambling between the West Midland and the south-eastern texts. K&T do not comment on this difference, other than to note that the large difference cannot be ascribed to a different percentage in basic VO orders between the two groups of texts, but mainly constitutes a real difference in pronoun scrambling. They conclude that the south-eastern texts are more conservative in that they preserve (to a high degree) the scrambling of pronouns so typical of OE, while the West Midland texts are more innovative in leaving pronouns in their in-situ position.

There is, however, a natural interpretation of these facts in our scenario. What changes in the EME period is the metrical evaluation of definite DPs from light to heavy. Given that there is enough other evidence that the English I-domain is weight-sensitive, definite DPs will be spelled out in the v-domain, giving rise to de-accentuation in situ in the English vP. Pronouns are unaffected by this change and will undergo scrambling to the C-domain for reasons of scope transparency. This is the state of affairs that we see in the south-eastern texts.

The West Midland texts are indeed more innovative. In the present account, however, we can make precise in which respect these texts are innovative. Note first that the new south-eastern grammar is rather complex: while referential DPs display their IS-status mainly only via PF-transparency (given definite DPs are de-accented and non-given definite DPs are stressed in their in-situ position), pronouns display their IS-status in terms of scope or LF-transparency in that they are moved and spelled out in the C-domain.

In this respect, the new West Midland grammar is simplified. Given that the new EME grammar allows for de-accentuation in situ (to accommodate given heavy objects), also the IS-status of pronouns can be displayed in a more economical way via PF-transparency, by being spelled out in their de-accented in-situ position in the vP. This step would follow if we assume the presence of the following economy condition in the grammar.

- (48) Economy of spell-out:
 A syntactic constituent is spelled out in the smallest domain in which its PF-conditions are satisfied

To conclude this argument, the grammar of the West Midland texts is simpler, since the IS-status of all referential objects (of both DPs and pronouns) is displayed via PF-transparency. The grammar of the south-eastern dialects, on the other hand, displays a more complex mixed system: the IS-status of pronouns is displayed via LF-transparency (as in OE), while the IS-status of definite DPs is necessarily only displayed via PF-transparency.

Before I address the issue of whether there is evidence for basic OV order in EME, I would like to briefly discuss how the condition in (48) squares with our previous assumption about spell-out preferences. Recall that in (10) above, I proposed a default condition on spell-out that favours the higher copy, to account for OHG data. The potential conflict can be resolved by assuming two dedicated spell-out preferences, as proposed in (49). I will leave this issue for further discussion.

- (49) Spell-out preferences:
 In an LF-transparent language, a syntactic constituent is spelled out in its scope position (preference for the higher copy)

In a PF-transparent language, a syntactic constituent is spelled out in the smallest domain in which its PF-conditions are satisfied.

To summarize, the unification of the placement of referential objects constitutes the first step in the development towards a pure VO word order in the history of English. At the beginning of the EME period, pronouns start to be realized postverbally. Quantified and negative objects follow suit much later. I have nothing to say about this step, except that it must be described as another process of unification or simplification in the present approach. A mixed system, in which non-quantified objects are PF-transparent and quantified objects are scope-transparent is simplified in that quantified objects lose their scope features. This means that sentences with quantifiers become ambiguous in English, while scope in German is read off of the spell-out position of quantifiers (scope transparency). When quantified expressions lose their scope features, they will – like non-quantified objects – be spelled out in the v-domain due to the principle in (48). Note that this last step is not a necessary step, since a mixed system in which quantified and negated objects are scope-transparent, but referential objects are PF-transparent, is preserved in Modern Icelandic.

7.4 Evidence for basic OV order in EME?

Before I address the development in German, I would like to comment on the arguments of K&T for basic OV order in EME. Since they find an average of 30% of superficial OV orders with referential objects in their texts, and the scrambling rate for referential objects is only 5%, they conclude that around 25% of word orders display an OV base.

In the present account, scrambling of referential objects should be limited to light DPs. Furthermore, note that a preverbal DP can also be taken to be derived from a VO base in the present account, as long as it counts as metrically light in the relevant sense. In future work, I would like to check K&T's entire data to see whether this prediction is borne out. Here, I can only discuss the sentences they present in their paper and note that all of them seem to adhere to the weight condition. For sake of illustration, let us look at the data in (50) (their Examples (32)) below.

- (50) a. *þeos ne schulen neauer song singen*
 these not shall never song sing
in heouene (CMHALL, 142, 222)
 in heaven
 'These shall never sing songs in heaven'
- b. *and makede him fleme þere he hadde er*
 and made him outcast where he had before
louerd iben (CMTRINIT, 61, 822)
 lord been
 'and made him an outcast where he had earlier been a lord'
- c. *þat ne haue noht here sinnes forleten* (CMTRINIT, 67, 934)
 who NEG have not their sins forsaken
 'who have not forsaken their sins'

The nominals in (50ab) arguably form a complex predicate with the verb (and hence resist scrambling). They are undoubtedly light noun phrases, which hence may be spelled out preverbally, but may have their base position postverbally in the present account. A question is raised by the metrical status of the direct object in (50c). While it is clearly branching, it will not count as metrically heavy if the possessive pronoun is analyzed as a DP occupying a specifier position in the extended projection of the noun. We know that possessives are reanalyzed as D-heads later on in the history of English, but I know of no evidence that they already constitute heads in EME.

Along these lines, all the data being proposed as constituting evidence for underlying OV order in EME (and by the way, also for OE) should be scrutinized. This, however, goes beyond the scope of this paper. In the following section, I will discuss in some detail the possible impact of the grammaticalization of the definite determiner on the complex interaction between word order and the expression of IS-categories in the history of German.

7.5 The grammaticalization of the definite determiner in German

The question that arises at this point is why the grammaticalization of the definite determiner did not have a similar effect in the history of German. One possibility would be to assume that the placement of discourse-given constituents in the preverbal domain in OHG followed from scope transparency rather than from PF-transparency. That is to say that given constituents in the preverbal domain were spelled out in the C-domain (to scope out of the assertion operator), while the placement of constituents representing new information followed from PF-transparency, hence their spell-out in postverbal position.

A precondition for the spell-out of discourse-given (heavy) definite DPs in the C-domain is their possible spell-out in the I-domain, as we have seen above. Hence a speaker of Middle High German (MHG) who analyzes a discourse-given DP as occupying the C-domain, will assume that the prosodic mapping in the I-domain is not weight-sensitive.¹⁰

The question then arises of which factor was responsible for the change in the positioning of focused constituents in the history of German. In the following section, I will discuss the impact of the preverbal focus position on predicate formation in the history of German.

7.6 The reanalysis of the preverbal focus position in the history of German

I want to investigate the hypothesis that the preverbal focus position was reanalyzed as a neutral position for licensing complements and constitutes the diachronic basis for a strength-sensitive mapping, which allows for the assignment of nuclear stress to the preverbal object in modern German.

Note first that the preverbal focus position leads to the introduction of a metrically strong position in front of the verb, instantiating the prosodic pattern (s w). Thus, we may assume that this position is open for light as well as heavy arguments and predicates.

Schlachter (2010) notes that heavy predicates, including predicative PPs, appear in preverbal position with increasing frequency in late OHG. We may assume that this change is a first effect of the grammaticalization of the definite determiner in OHG. In early OHG texts, light predicates are typically realized in preverbal position, while heavy predicates are predominantly realized in postverbal position. Note that predicative elements form a joint prosodic constituent with the verb, and are stored in the lexicon with their possibly non-transparent meaning as compounds, which have the prosodic pattern (s w) in Germanic. Thus, placing predicates in preverbal position allows verbal compounds to have the same metrical structure as nominal compounds.

This scenario is supported by the observation that postverbal predicates disappear in MHG, but postverbal arguments remain possible till the end of the Early New High German (ENHG) period. Bies (1996) reports that light arguments can appear in

10. Note that this evidence is much scarcer, if not completely absent, for the EME speaker. It is well-known that case marking is eroding at the turn from OE to ME. This factor, also an independent factor, is probably responsible for the lack of evidence for scope transparency, since in systems that lack case but have preserved scrambling, like modern Dutch, objects may not cross the subject, which otherwise constitutes a secure sign of inverse scope and scope transparency.

postverbal position in ENHG which are exclusively interpreted as constituting narrow focus. Some examples are given in (51).

- (51) a. *sunder daz sie auch sehen Lazarum*
 but that they also see Lazarus
 ‘but that they see also Lazarus’
- b. *alse dit is ghedaen so selmen nemen hursene melc*
 when this is done so shall-one take horse-milk
 ‘when this is finished then one shall take milk of horses’
- c. *gedenck waz davon kumet, der seinen guten freund*
 ze lang reizet, tu uff die tür. schlauff uff dein hercz, laß ein den
 gemynten...
 think what comes of it, when one his good friend to-long teases, open
 up the door, open ut hour heart, permit to enter the loved one

Bies (1996) argues that there was a functional split as far as focused elements in ENHG were concerned. Constituents that were part of new information (wide focus) were predominantly realized in a preverbal position, while constituents that represented narrow focus were predominantly realized in postverbal position. Since these elements were not necessarily heavy, as can be seen in the examples in (51), they do not lend themselves to an analysis of having been subject to extraposition in ENHG. The most likely analysis is that these objects are analyzed as occupying a vP-internal position and as displaying their IS-status in a PF-transparent way.

Given this background, we can envisage the following scenario. In a first step, the preverbal contrastive focus position is reanalyzed as a position for all types of narrow focus. Since in natural discourse narrow focus is typically read contrastively due to an implicature of the Maxim of Quantity (cf. Grice 1975), the contrastive import of the position is likely to be reinterpreted as due to a pragmatic restriction.

In a second step, the prosodic pattern (s w) arising from narrow focus and the verb due to focus restructuring is reanalyzed as a prosodic pattern derived from a strength-sensitive mapping in which the verb is not necessarily given, opening up the pattern for wide focus readings. This stage is arguably represented by ENHG.

In a third step, we can assume that the marked option of low spell-out of narrowly focused constituents is lost at the end of ENHG, after intrinsic heading of arguments following the pattern of intrinsic heading of predicates becomes the default option. This means that at the end of the ENHG period, learners perceived German to be a predominantly LF-transparent language and began to place referential DPs exclusively according to their IS-status in their respective scope positions.

In conclusion, it stands to reason that the dropping of the weight condition was the basis for the preverbal placement of (heavy) predicates. Since the placement of predicates arguably followed the prosodic pattern of contrastive focus in OHG, a

similar effect was excluded in the history of English, since the contrastive focus position in OE – though being preverbal – was not adjacent to the verb, as Petrova and Speyer (2011) have shown.

This scenario is rather speculative and I will have to leave its empirical exploration for future research. However, I would like to point out that the perspective advocated in this paper opens up new research questions which might advance not only our understanding of language change but also our understanding of the complex interaction between syntax, prosody and information structure.

8. Conclusions

In this paper, I have argued that the distinction between OV and VO languages should not be accounted for by a distinction in the base. More specifically, I have argued that the pertinent distinction can be reduced to the workings of two parallel interface constraints that define the optimal mapping from syntax to PF and from syntax to LF. I have laid out the historical conditions and the possible grammatical factors that led English into developing into a PF-transparent VO language and German into developing into a scope-transparent OV language. The core factor in both languages is the grammaticalization of the definite determiner, which led to the introduction of heavy given DPs in the I-domain and disturbed the balance that existed between the weight condition and the IS-conditions in OHG and OE. One of the major factors that led to the retention of the weight condition in the I-domain in the history of English and to its loss in the history of German was whether the grammar allowed for scrambling of objects into the C-domain crossing over the subject. While it might be said that the loss of case did not directly lead to the loss of OV orders, it contributed to a weakening of scrambling in the history of English and so removed important evidence for scope transparency that is robustly present in the history of German.

In essence, though many questions remain open, the present proposal explains the loss of mixed word orders in OHG and OE and the subsequent developments by combining the standard hypothesis of loss of case with a factor not considered so far in the literature, namely the grammaticalization of definite determiners.

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