

SYNTACTIC VS. POST-SYNTACTIC MOVEMENT*

Susi Wurmbrand
University of Connecticut

1. Introduction

This paper addresses the question of where word order variation that has no semantic effect is represented. The case I will concentrate on is multiple verb constructions in West Germanic, which involve complex patterns of re-ordering of the verbal elements involved. As an illustration consider (1): while Dutch allows either order between a modal and the selected infinitive (in this construction), the infinitive has to precede the modal in German, whereas the modal has to precede the infinitive in Afrikaans. Importantly, all sentences in (1) have the same meaning and re-ordering has no semantic effect.

(1) *John can work tomorrow.*

a.	dat	Jan	morgen	werken	kan /	kan	werken	Dutch
	that	Jan	tomorrow	work	can /	can	work	
b.	dass	Hans	morgen	arbeiten	kann /	*kann	arbeiten	German
	that	John	tomorrow	work	can /	can	work	
c.	dat	Jan	môre	*werk	kan /	kan	werk	Afrikaans
	that	Jan	tomorrow	work	can /	can	work	

In this paper I will pursue the idea that semantically vacuous word order changes are not part of syntax proper, but rather occur in a post-syntactic (PF) component. The mechanism suggested for this re-ordering will be language and construction specific inversion of sister nodes. I will present two preliminary arguments for this view: i) morphological operations feed verb cluster re-ordering; ii) only the word orders that cannot be derived by simple inversion of sister nodes show semantic/pragmatic effects.

2. Re-ordering tools

Before discussing various options that have been suggested to derive the word order differences in verb clusters, it is important to note that some re-ordering mechanism is necessary and that the different word orders cannot be just the result of different base structures. While English is a strictly head-initial language where the linear order of verbs corresponds to the semantic order (cf. (2)), it is well-known that West Germanic languages have some head-final properties (e.g., NP objects always precede the selecting verbs (in what follows, numbers indicate the

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semantic order in the following way: “1” selects/scopes over “2”; “2” selects/scopes over “3” etc.). One might thus suggest that the descending order of verbs found in examples such as the ones in (3) in German are simply the result of the head-final structure of German VPs.

- (2) a. John can (1) swim (2)
 b. John will (1) be (2) elected (3)
 c. John has to (1) want to (2) leave (3)
 d. John wants to (1) have to (2) leave (3)
- (3) a. dass Hans schwimmen (2) kann (1)
 that John swim can
 b. dass Hans schwimmen (3) können (2) will (1)
 that John swim can wants
 ‘that John wants to be able to swim’
 c. dass Hans schwimmen (4) können (3) müssen (2) wird (1)
 that John swim can must will
 ‘that John will have to be able to swim’

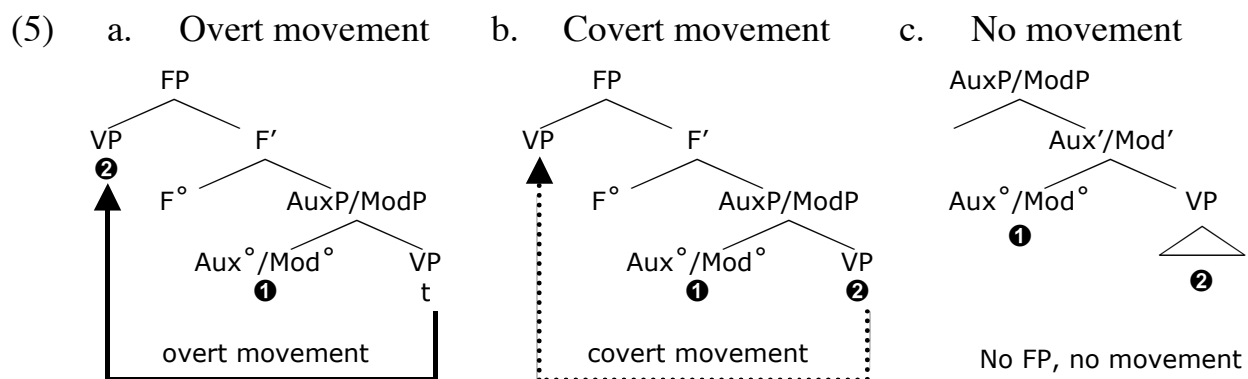
This view, however, quickly runs into problems when we look at other constructions. As shown in the German auxiliary-modal-infinitive construction in (4), the 3-2-1 order (the strictly head-final order) is only possible in certain dialects; the unmarked orders of these constructions are the 1-3-2 order and the 3-1-2 order. Furthermore, the 1-2-3 order is also possible in some Swiss dialects. The meaning of all the cases in (4) is again the same.

- (4) ‘since he (has) wanted to buy it’
- a. %weil er es kaufen wollen hat 3-2-1
 since he it buy want has
 b. weil er es hat kaufen wollen 1-3-2
 c. weil er es kaufen hat wollen 3-1-2
 d. %weil er es hat wollen kaufen 3-1-2

Thus, to derive orders other than the 1-2-3 and the 3-2-1 order, different base structures (head-final vs. head-initial) are not sufficient and some re-ordering mechanism is necessary. The question then is: Where/how/why does re-ordering take place? In the following subsections, I will first lay out the basic syntactic approach to verb cluster re-ordering (since there are many different syntactic accounts, I will use a straw man version (for an extensive overview of the literature on this topic the reader is referred to Wurmbrand, to appear), followed by an illustration of the post-syntactic view suggested here and a short comparison of the two views. In section 3, I will then provide the arguments for the post-syntactic view.

2.1. Syntactic view

The general approach to verb cluster re-ordering assumes that the word order variation is due to different syntactic derivations in different languages and constructions. Typically, movement is triggered by certain features, and the variation is attributed to either strong vs. weak features (yielding overt vs. covert movement, respectively), or the presence vs. absence of the triggering features. Assuming a head-initial base structure, the 2-1 order would then be derived as in (5)a, where the lower verb (phrase) undergoes overt movement, which is triggered by some feature of the higher modal/auxiliary or some functional head above the modal/auxiliary (I abstract away here from the question of whether re-ordering is head or phrasal movement; see Wurmbrand, to appear, for an overview). The 1-2 order, on the other hand, either involves covert movement as in (5)b (i.e., the relevant feature is weak) or no movement as in (5)c (i.e., the triggering feature is missing altogether).



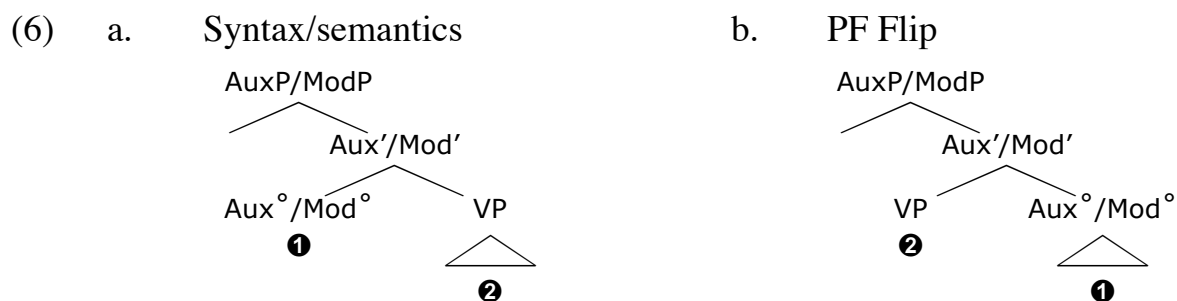
If we now compare modal-infinitive constructions (e.g. *he can swim*) and auxiliary-participle constructions (e.g., *he has left*) in some of the West Germanic languages and dialects, we end up with the following settings (for comments and references see Wurmbrand forthcoming, to appear; a regularly updated bibliography on verb clusters can also be found at: <http://www.linguistics.uconn.edu/susi.html>).

Table 1: *Verb clusters with two verbal elements (settings for head-initial base)*

LANGUAGE	ORDERS		SETTINGS	
	AUX-PART	MOD-INF	AUX-PART	MOD-INF
Afrikaans	2-1	1-2	overt	covert/no mov't
Dutch (1=finite)	1-2	1-2	covert/no mov't	covert/no mov't
Dutch (1=non-finite)	2-1	2-1	overt	overt
English	1-2	1-2	covert/no mov't	covert/no mov't
Frisian	2-1	2-1	overt	overt
German	2-1	2-1	overt	overt
Swiss German	2-1 %1-2	2-1 1-2	overt %covert/no mov't	overt covert/no mov't
West Flemish	2-1	1-2	overt	covert/no mov't

2.2. Post-syntactic reordering

The post-syntactic view on verb cluster re-ordering I would like to suggest here (following a suggestion made in Haegeman and van Riemsdijk 1986), on the other hand, does not involve any special movement operations or verb cluster features in the syntax, but rather treats verb cluster reordering as a PF linearization process. Specifically, I assume the mechanism “Flip” proposed by Williams (1999, forthcoming), whereby sister nodes are inverted according to language specific inversion/precedence rules. As illustrated in (6), to derive the 2-1 order (again, assuming a head-initial base), no alterations are made in the syntax/semantics component; rather inversion takes place at the PF-branch, provided the invertees are sisters.



To derive the distribution of modal-infinitive constructions and auxiliary-participle constructions in languages and dialects mentioned in the previous section, the following PF inversion settings have to be assumed.

Table 2: *Verb clusters with two verbal elements (settings for head-initial base)*

LANGUAGE	ORDERS		SETTINGS	
	AUX-PART	MOD-INF	AUX-PART	MOD-INF
Afrikaans	2-1	1-2	flip	—
Dutch (1=finite)	1-2; 2-1	1-2; 2-1	optional flip	optional flip
Dutch (1=non-finite)	1-2; 2-1	1-2	optional flip	—
English	1-2	1-2	—	—
Frisian	2-1	2-1	flip	flip
German	2-1	2-1	flip	flip
Swiss German	2-1; %1-2	2-1; 1-2	(%optional) flip	optional flip
West Flemish	2-1	1-2	flip	—

2.3. Summary and comparison

Although I have only presented the distribution of two-verb clusters here, we have seen that the situation is quite complex. One important point to note is that the word order variation found (both across languages and constructions) does not correlate with any other properties of grammar (neither in general nor within one language). That is, for instance the overt/covert differences suggested in Table 1 do not represent general properties of the languages under considerations (in fact, if we turn to more complex verb clusters, these settings do not even always carry over to all modal-infinitive constructions). Thus, it seems that the linearization of verb clusters is subject to language specific ordering restrictions which have to be

represented somewhere as underivable and unpredictable settings (at least at the current stage of research). Under the syntactic view, this is achieved by (arbitrary) feature specifications, whereas under the post-syntactic view, this is achieved by (arbitrary) inversion rules. In this sense, neither approach offers anything interesting by way of explanation.

Nevertheless I believe that there are empirical and theoretical reasons for favoring the post-syntactic view. To begin with the latter, one difference that can be considered as an advantage of the post-syntactic view is that it allows us to define a straightforward syntax \approx semantics mapping. Since verb cluster re-ordering does not occur in syntax proper, it is predicted that it has no semantic effect (but see section 3.2). Verb cluster constructions are uniformly represented in the 1-2-3 hierarchy in syntax and semantics, and hence straightforwardly interpreted in that hierarchy, independently of the linear order of the verbs. This is an important difference between verb cluster re-ordering and operations such as VP-scrambling or VP-fronting; although all of these operations target the same syntactic unit (VP), fronting and scrambling clearly have effects on the interpretation (they alter the topic/focus structure), while no such properties have been reported for (most) verb cluster re-ordering. Moreover, under the syntactic view, it is not only mysterious why certain languages/constructions can, cannot or have to involve re-ordering, it is also not clear what the motivation for the triggering features or FPs is. What kind of features do VPs have to check? Why are there no morphological, syntactic, or semantic properties that correlate with the (number of) FPs. Note that this contrasts sharply with approaches such as the one offered in Bobaljik and Thráinsson (1998) where it is suggested that clause structure can be different in different languages, however, crucially, there the differences are motivated by a range of properties that correlate with the suggested difference in phrase structure. No correlation has ever been provided for the differences in verb cluster ordering. Thus, if FP's only purpose is to derive word order, its motivation is dubious and it seems that the syntactic view contributes little in terms of explanatory value. As mentioned above, shifting verb cluster re-ordering to the post-syntactic component does not solve the problem of unpredictability. However, it does allow us to maintain a restrictive syntactic component and opens the possibility for discovering restrictions on verb cluster ordering of a different nature (e.g., prosodic properties), which will hopefully provide us with an explanation of what regulates the linearization in these constructions. In the next section, I will provide two (preliminary) empirical arguments which support the post-syntactic view.

3. Arguments for post-syntactic inversion

3.1. Morphology feeds verb cluster re-ordering

The first argument for post-syntactic verb cluster re-ordering comes from the relation between verb cluster re-ordering and the IPP (Infinitivus pro participio 'Infinitive for participle') conversion. The argument goes as follows: i) I will argue that the IPP conversion is a morphological operation; ii), we will see that IPP conversion feeds verb cluster reordering. From i) and ii) it then follows that verb

cluster re-ordering occurs *after* other morphophonological operations—hence is post-syntactic.

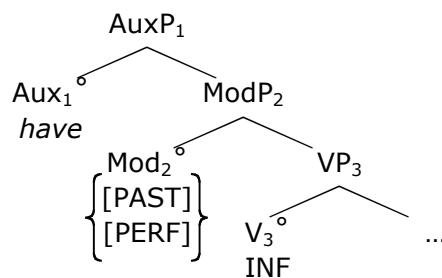
Let me illustrate the IPP phenomenon first. As shown in (7) from Standard German, non-main verb modals selected by the auxiliary *have* occur as infinitives, rather than as participles. Note that the IPP effect is only found in specific environments—namely, as argued in Wurmbrand (2001), when a functional verb such as a modal or a causative combines with the auxiliary *have*. Participles do not generally come out as infinitives in IPP languages, nor do modals under *have* generally occur as participles (see the main verb use of *want* in (7)c).

- (7) a. weil er es hat kaufen wollen
 since he it has buy want-IPP
 ‘since he (has) wanted to buy it’
- b. *weil er es hat kaufen gewollt
 since he it has buy want-PART
- c. weil er es gewollt hat
 since he it want-PART has
 ‘since he (has) wanted it’

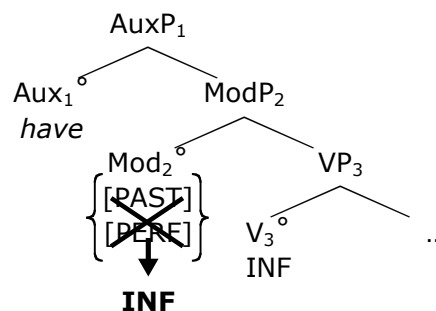
The account for the IPP phenomenon I will present here is based on the observation that IPP constructions represent typical form/meaning mismatches: the modal in (7)a is a participle semantically but an infinitive morphologically. Since, as we will see shortly, IPP constructions are interpreted like any other auxiliary-participle construction in German, I argue that IPP constructions do not involve a special syntax/semantics and that the IPP infinitive is indeed a participle in syntax/semantics (cf. (8)b). To account for the form/meaning mismatch I suggest the morphophonological impoverishment rule in (8)a, which states that past or perfect features delete in cases where a verb selecting an infinitive is itself selected by *have*. Syntactic participles which have the past/perfect features stripped away will then be realized as infinitives by default (cf. (8)c).

- (8) a. [PAST/PERF] \rightarrow \emptyset / [*have* [____ [INF]]] (linear order irrelevant)

b. Syntax/LF



c. PF



This analysis involves two crucial assumptions: i) IPP constructions are interpreted like other present perfect constructions; and ii) participles contribute a crucial part of the meaning to the interpretation of auxiliary-participle constructions. I will not be able to defend ii) here (see for instance Toman 1986, Ballweg 1988, Ehrlich

1992, Klein 1994, Zeller 1994, Grewendorf 1995, Cowper 2003a, b, Wurmbrand in prep.). But I would like to provide some motivation for i) here.

It is well-known that German present perfect morphology is ambiguous between an English type PERFECT and a true PAST tense interpretation (and in fact, certain other interpretations; see Thieroff 1994, Löbner 2002, von Stechow 2002). The example in (9)a (from Vater 2002) illustrates the PAST interpretation, whereas the one in (9)b (von Stechow 2002) exhibits the PERFECT interpretation.

- (9) a. Hans hat den Schlüssel verloren [hat ihn aber gottseidank
John has the key lost [has it but thank-goodness
wiedergefunden]
again-found
'John (*has) lost his key, but thank goodness found it again.'
- b. Franzis hat mich seit 4 Uhr dreimal angerufen
Frances has me since 4 o'clock three-times called
'Frances *(has) called me three times since 4 o'clock.'

To show that IPP constructions involve the same ambiguity—i.e., are interpreted either as PERFECT or as PAST—I will use the diagnostics developed in von Stechow (2002). Von Stechow shows that there are two versions of *seit* 'since' in German: *seit*₁ modifies an Extended Now (PERFECT) and is compatible with any Aktionsart. *Seit*₂, on the other hand, introduces an Extended Now and can combine with any tense, however, it requires a homogeneous state/event and is incompatible with achievements. Thus if a present perfect construction is compatible with an achievement, we can conclude that it involves *seit*₁ and is interpreted as PERFECT. This was the case in (9)b. If a present perfect construction is interpreted as PAST (as in (10)), it can only involve *seit*₂, which is possible with a state predicate as in (10)b, but not an achievement as in (10)a.

- (10) a. ??Franzis hat mich gestern seit 4 Uhr dreimal angerufen
Frances has me yesterday since 4 o'clock three-times called
'Yesterday, Frances called me three times after 4 o'clock.'
- b. Wir sind gestern seit genau dreißig Jahren verheiratet gewesen
We are yesterday since exactly 30 years married been
'Yesterday, we had been married for exactly thirty years.'

Importantly for the discussion here, IPP constructions show the same properties. As illustrated in (11)a, IPP constructions are compatible with the PERFECT interpretation. Since *three times* makes the event non-homogeneous, (11)a cannot involve *seit*₂, but only *seit*₁, which in turn requires a PERFECT interpretation. This is further supported by the impossibility of (11)b,c when the non-homogenous modifier *three times* is added. Although *seit*₂ is compatible with PRESENT ((11)b) or PAST ((11)c), these constructions are only possible when they are homogeneous (i.e., without *three times*), in contrast to (11)a. (In all of these examples, *seit* is, of course, to be taken as a modifier of the modal.)

- (11) a. Ich habe ihn seit 4 Uhr dreimal anrufen wollen
 I have him since 4 o'clock three-times call want
 'Since 4 o'clock, I have wanted three times to call him'
- b. Ich will ihn seit 4 Uhr (*dreimal) anrufen
 I want him since 4 o'clock three-times call
 lit. 'I want to call him (*three times) since 4 o'clock.'
 'Since 4 o'clock, I have been wanting to call him (*three times).'
- c. Ich habe ihn gestern seit 4 Uhr (??dreimal) anrufen wollen
 I have him yesterday since 4am (3-times) call want
 'Since 4am, I have wanted three times to call him'

To conclude this short excursus, the distribution of *seit* shows that the IPP constructions behave exactly like other present perfect constructions—i.e., they are ambiguous between a PAST and PERFECT interpretation.

Let me now return to verb clusters. Assuming that IPP is indeed a morphophonological operation, the syntactic and post-syntactic view make different predictions regarding the interaction of the IPP and verb cluster re-ordering: If verb cluster re-ordering is syntactic, the IPP should count as a participle; if verb cluster re-ordering is post-syntactic, the IPP could count as an infinitive. In short, the facts support the latter. To illustrate this point, consider the distribution of auxiliary-modal-infinitive constructions in Standard German. As pointed out above, the order in verb clusters in Standard German is generally 3-2-1. There is one exception, however. Auxiliary-modal-infinitive constructions do not allow the 3-2-1 order (cf. (12)a) but require the 1-3-2 order (or the 3-1-2 to which I will return below). Note that this re-ordering is not restricted to IPP constructions as in (12)b, but also found in future constructions (cf. (12)c).¹ That is, the 1-3-2 order cannot be attributed to the IPP, since future modal constructions involve 'regular' infinitives and no IPP conversion.

- (12) a. *weil er es kaufen können hat *3-2-1
 since he it buy can has
- b. weil er es hat [kaufen können] 1-3-2
 since he it has [buy can] IPP
- c. weil er es wird [kaufen können] future: 1-3-2
 since he it will [buy can] Future; not IPP

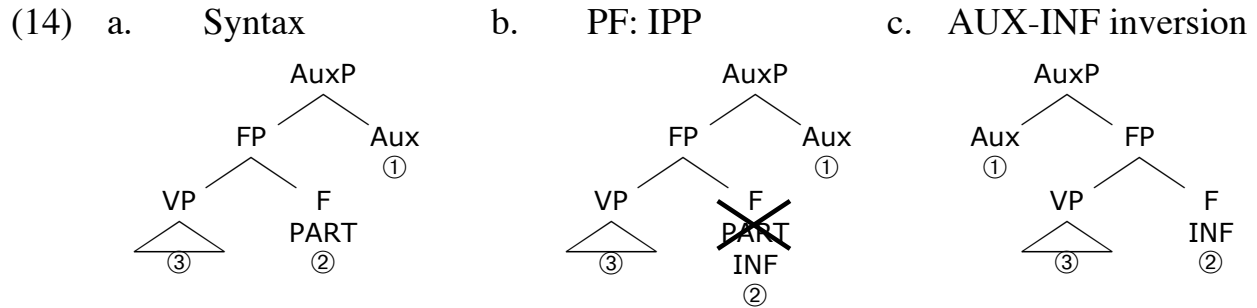
I therefore suggest the inversion rule in (13). The crucial part of this rule is that it only applies when the construction involves an auxiliary and a functional infinitive. In all other contexts, inversion does not take place; e.g., there is no inversion between modals and functional infinitives, between auxiliaries and main

¹ The future construction is possible in the 3-2-1 order as well; the reason seems to be that *will* can either be classified as an auxiliary or a modal. MOD-MOD-V constructions do not invert (only the 3-2-1 order is possible). See Wurmbrand (forthcoming, to appear) for an overview of three-verb clusters in West Germanic.

verb infinitives, or between auxiliaries and participles (for space reasons, I cannot include the data here; see Wurmbrand forthcoming, to appear).

- (13) Invert an auxiliary with its sister iff the sister is a functional infinitive.
 Functional verbs in German: modals, causatives, perception verbs (see Wurmbrand 2001 for motivation).

Let us put things together now and look at the derivation of (12)b, which is depicted in (14). First, in syntax ((14)a), the hierarchical 1-2-3 structure is built (for convenience, I have given a head-final structure for German, but nothing hinges on that) and nothing else happens. This has the desired result that IPP constructions are interpreted as normal present perfect constructions. At PF ((14)b), the first rule that applies is the PAST/PERFECT impoverishment rule. Since (12)b constitutes an IPP environment, the PAST/PERFECT features are deleted and the modal shows up as a default infinitive. Finally, verb cluster rules apply, and since the environment for (13) is now met in (14)b, the rule applies and re-orders the auxiliary and its sister as in (14)c.



Further evidence for (13), in particular the claim that re-ordering is triggered by functional infinitives and not functional elements in general, comes from the facts in (15). As shown in (15)a,b, the IPP is optional in certain constructions and for certain speakers. If, however, IPP does not apply, re-ordering is impossible and only the 3-2-1 order is allowed ((15)b,c). As before, if the IPP applies, re-ordering is generally obligatory ((15)d).

- (15) a. weil er ihn hat lesen sehen 1-3-2
 since he him has read see-INF
 ‘since he has seen him read’
- b. weil er ihn lesen gesehen hat 3-2-1
 since he him read seen-PART has
- c. *weil er ihn hat lesen gesehen *1-3-2
 since he him has read seen-PART
- d. *weil er ihn lesen sehen hat *3-2-1
 since he him read see-INF has

This distribution follows straightforwardly from the account presented here. In both (15)a and (15)b, the syntax projects the 1-2-3 hierarchy (as in (14)a), and the participles include PAST/PERFECT features, which get interpreted accordingly.

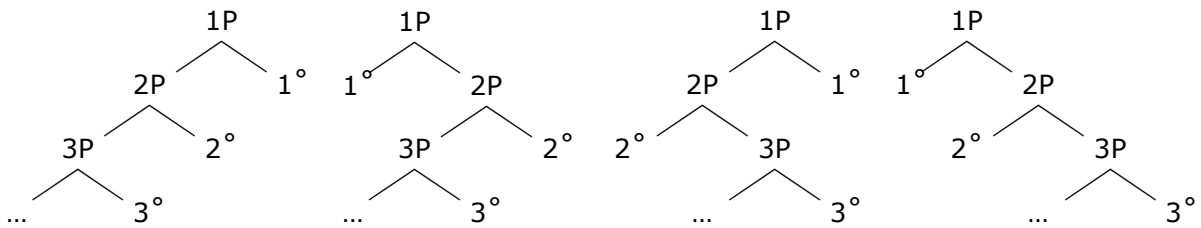
At PF, however, we now have a choice between proceeding as in (14)b, which would yield (15)a, or doing nothing—i.e., IPP does not apply. This choice, however, then has a crucial effect on the verb cluster inversion rule. Since in this case the environment for (13) is not met, the rule cannot apply and no re-ordering takes place. We thus end up with the 3-2-1 order in (15)b.

To conclude, we have seen that the output of the IPP conversion feeds verb clustering. Assuming the account of the IPP presented above, we can then conclude that verb clustering is post-syntactic.

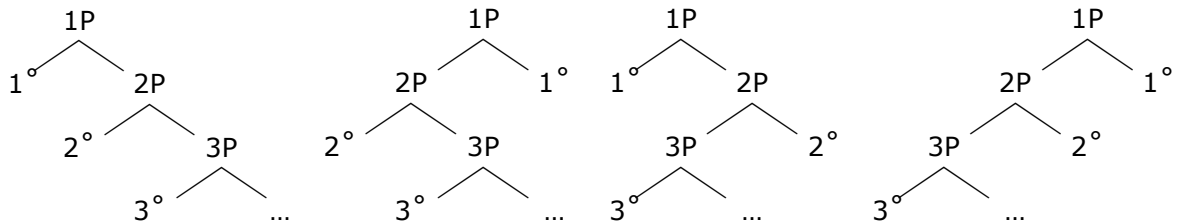
3.2. Syntactic vs. post-syntactic re-ordering

A second potential piece of argument for the account presented here comes from the distribution of verb clusters cross-linguistically. Recall that the rule suggested in section 2.2. triggers inversion of sister nodes. Turning to three-verb clusters now, *Flip* derives four of the possible six word orders: 3-2-1, 1-3-2, 2-3-1, and 1-2-3. As shown in (16) and (17), this is again independent of whether we assume a head-final or a head-initial base structure.

(16) *Head-final base structure*



(17) *Head-initial base structure*

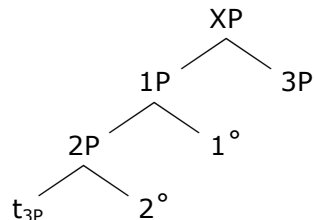


All of these orders are attested across West Germanic (see Wurmbrand forthcoming, to appear for details). However, in addition, we also find the 3-1-2 and 2-1-3 orders.² How can these orders be derived in the current system? *Flip* (alone) cannot produce these orders, since I have assumed that *flip* only affects sisters. The orders can only be derived if an additional operation occurs in syntax. Under a head-final base structure, the 2-1-3 order can be derived by extraposition of the lowest verb phrase (cf. (18)a), and the 3-1-2 order by leftward movement of the lowest verb (phrase), followed by *flip* of the highest verb and its sister (cf. (18)b). Under a head-initial base structure, the 2-1-3 order can be derived by

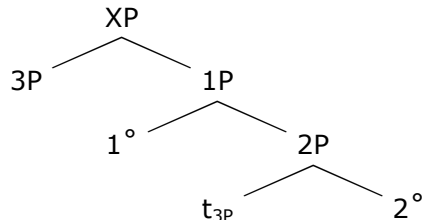
² I have, in fact, not encountered any cases of the 2-1-3 order, however, Schmid and Vogel (to appear) report such cases for certain German dialects.

leftward movement of the middle verb (cf. (19)a)³, and the 3-1-2 order can be derived by leftward movement of the lowest verb (phrase) as in (19)b.

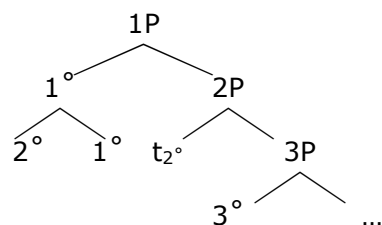
(18) a. Extraposition



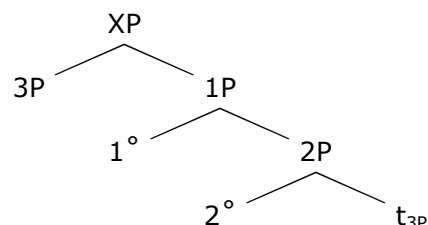
b. Leftward movement and *flip*



(19) a. Leftward movement of “2”



b. Leftward movement of “3”



This is exactly what I would like to propose here. There are two ways of verb cluster re-ordering—PF *flip* and syntactic movement. Although more empirical research is needed to draw firm conclusions, there is some initial support for this distinction. As pointed out earlier, verb cluster re-ordering generally does not seem to be motivated by any syntactic property and has no effect on the interpretation. This follows from the PF-account outlined above. However, if the 3-1-2 and 2-1-3 orders involve some syntactic movement, we would expect to find some semantic effect corresponding to these orders. Interestingly, semantic effects (namely focus changes) have been reported for exactly these orders (see the articles in É. Kiss and van Riemsdijk forthcoming for Hungarian, Schmid and Vogel, to appear for German, and M. Schönenberger, p.c. for a 3-1-2 construction in Swiss German.)

4. Summary and directions for future research

I have argued here for two types of verb cluster re-ordering—syntactic and post-syntactic. The major evidence for this distinction comes from the presence vs. absence of semantic effects and the feeding relation between the IPP conversion and verb cluster re-ordering. This proposal entails in one sense that there are two types of “syntax”—syntax proper and PF syntax (cf. what used to be called *stylistic syntax*). The former feeds into LF and involves an arguably universal structure \approx meaning mapping (note that this does not exclude true syntactic parameters as for instance Bobaljik and Thráinsson 1998 *split INFL parameter*). The latter feeds into prosody and PF and is the locus of language specific linearization (which has no semantic effect). The advantage of this split is that it allows us to return to a more universalist and explanatory syntax and away from purely descriptive language specific structure building. The disadvantage is, of course, that it puts more burden

³ Alternatively, 2-1-3 can be assumed that “3P” undergoes movement to the left of “2P” (yielding 1-3-2), followed by leftward movement of “2P” (yielding 2-1-3).

on the PF branch. However, as noted above, this burden might in fact prove fruitful in that it opens new possibilities and domains in our search for explanations regarding the nature of word order variation (such as the nature of PF constraints; word order and prosody etc.; see for instance Schmid and Vogel, to appear for some initial observations).

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